MITSUBISHI

Mitsubishi Programmable Controller

Transition from MELSEC-A/QnA (Large Type)Series to Q Series Handbook

(Fundamentals)

Mar. 2012 Edition

●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

Before using products introduced in this publication, please read relevant manuals and replacement handbooks carefully and pay full attention to safety to handle the product correctly.
In this publication, the safety precautions are classified into two levels:

"⚠ WARNING" and "⚠ CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this publication and keep it in a safe place for future reference.

[Design Precautions]

⚠ WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.

  (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.
  (2) When the programmable controller detects the following problems, it will stop calculation and turn off all outputs in the case of (a).
  In the case of (b), it will hold or turn off all outputs according to the parameter setting.
  Note that the A series module will turn off the output in either of cases (a) and (b).

	Q series module	A series module
(a) The power supply module has over current protection equipment and over voltage protection equipment.	Output OFF	Output OFF
(b) The CPU module self-diagnosis functions, such as the watchdog timer error, detect problems.	Hold or turn off all output according to the parameter setting.	Output OFF

  All outputs may turn on when an error occurs in the part, such as I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For fail-safe circuit examples, refer to "Appendix 8 General Safety Requirements" in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
  (3) Outputs may remain on or off due to a failure of an output module relay or transistor. Configure an external circuit for monitoring output signals that could cause a serious accident.

- In an output module, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.

- Configure a circuit so that the programmable controller is turned on first and then the external power supply.
  If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

- For the operating status of each station after a communication failure, refer to relevant manuals for the network.
  Incorrect output or malfunction due to a communication failure may result in an accident.

[Design Precautions]

⚠ WARNING

- When changing data of the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module/special function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.
  For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.
  Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure.
  To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.

- When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on.
  Take measures such as replacing the module with one having a sufficient current rating.

- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.

[Installation Precautions]

⚠ CAUTION

- Use the programmable controller in an environment that meets the general specifications in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.

- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

- When using an extension cable, connect it to the extension cable connector of the base unit securely.
  Check the connection for looseness.
  Poor contact may cause incorrect input or output.

- When using a memory card, fully insert it into the memory card slot.
  Check that it is inserted completely.
  Poor contact may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may result in damage to the product.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to the relevant sections in the QCPU User's Manual (Hardware Design, Maintenance and Inspection) and in the manual for the corresponding module.

- Do not directly touch any conductive part of the module.
  Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠ WARNING

- Shut off the external power supply for the system in all phases before wiring.
  Failure to do so may result in electric shock or damage to the product.

- After wiring, attach the included terminal cover to the module before turning it on for operation.
  Failure to do so may result in electric shock.

⚠ CAUTION

- Ground the FG and LG terminals to the protective ground conductor dedicated to the programmable controller.
  Failure to do so may result in electric shock or malfunction.

- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.

- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly.
  Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.

- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections could result in short circuit, fire, or malfunction.

- Tighten the terminal screw within the specified torque range.
  Undertightening can cause short circuit, fire, or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.

[Wiring Precautions]

⚠ CAUTION

- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring.
  Do not remove the film during wiring.
  Remove it for heat dissipation before system operation.

- Mitsubishi programmable controllers must be installed in control panels.
  Connect the main power supply to the power supply module in the control panel through a relay terminal block.
  Wiring and replacement of a power supply module must be performed by maintenance personnel who is familiar with protection against electric shock. (For wiring methods, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection)).

[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch any terminal while power is on.
  Doing so will cause electric shock.

- Correctly connect the battery connector.
  Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire.
  Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.

- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or module fixing screws.
  Failure to do so may result in electric shock.
  Undertightening the terminal screws can cause short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

[Startup and Maintenance Precautions]

⚠ CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running CPU module from the peripheral connected, read relevant manuals carefully and ensure the safety.
  Improper operation may damage machines or cause accidents.

- Do not disassemble or modify the modules.
  Doing so may cause failure, malfunction, injury, or a fire.

- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm (9.85 inches) away in all directions from the programmable controller.
  Failure to do so may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to the relevant sections in the QCPU User's Manual (Hardware Design, Maintenance and Inspection) and in the manual for the corresponding module.

- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively.
  Exceeding the limit of 50 times may cause malfunction.

- Do not drop or apply shock to the battery to be installed in the module.
  Doing so may damage the battery, causing the battery fluid to leak inside the battery.
  If the battery is dropped or any shock is applied to it, dispose of it without using.

- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.
  When disposing of batteries, separate them from other wastes according to the local regulations.
  (For details of the battery directive in EU member states, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).)

[Transportation Precautions]

⚠ CAUTION

- When transporting lithium batteries, follow the transportation regulations.
  (For details of the regulated models, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).)

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

* The handbook number is given on the bottom left of the back cover.

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Mar., 2005	L(NA)-08043ENG-A	First edition
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Japanese Handbook Version L-08042-J

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CONTENTS

SAFETY PRECAUTIONS ..... A - 1
CONDITIONS OF USE FOR THE PRODUCT ..... A - 9
REVISIONS ..... A - 10
CONTENTS ..... A - 12
GENERIC TERMS AND ABBREVIATIONS ..... A - 17

CHAPTER 1 INTRODUCTION 1 - 1 to 1 - 15

1.1 Considerations before Selection of Alternative Models for Replacement ..... 1 - 1
1.2 Suggestions for Transition from the A/QnA (Large Type) Series to the Q Series ..... 1 - 3
1.2.1 Advantages of transition to Q series ..... 1 - 3
1.2.2 Suggestions for transition to Q series ..... 1 - 4
1.2.3 Precautions for transition from large-sized A/QnA series to Q series ..... 1 - 15

CHAPTER 2 CPU MODULE REPLACEMENT 2 - 1 to 2 - 29

2.1 List of Alternative CPU Module Models for Replacement ..... 2 - 1
2.2 CPU Module Specifications Comparisons ..... 2 - 10
2.3 CPU Module Functional Comparisons ..... 2 - 18
2.3.1 Functional comparisons between A2CCPU, AnNCPU and Q series CPU ..... 2 - 18
2.3.2 Functional comparisons between AnACPU, AnUCPU and Q series CPU ..... 2 - 20
2.3.3 Functional comparisons between QnACPU and Q series CPU ..... 2 - 22
2.4 Precautions for CPU Module Replacement ..... 2 - 24
2.4.1 Memory for CPU module ..... 2 - 24
2.4.2 Keyword registration and password registration ..... 2 - 26
2.4.3 Write during RUN ..... 2 - 27
2.4.4 No. of base unit I/O slots ..... 2 - 28
2.4.5 Programming tool and connection cable for Q series CPU ..... 2 - 29

CHAPTER 3 REPLACING I/O MODULES 3 - 1 to 3 - 117

3.1 List of Alternative I/O Module Models ..... 3 - 1
3.1.1 List of alternative Q series standard type module models ..... 3 - 1
3.1.2 List of alternative Q series large type module models ..... 3 - 23
3.2 I/O Module Specifications Comparison ..... 3 - 25
3.2.1 Input module specifications comparison ..... 3 - 25
3.2.2 Output module specifications comparison ..... 3 - 68
3.2.3 Combined I/O module specifications comparison ..... 3 - 107
3.2.4 Interrupt module specifications comparison ..... 3 - 113
3.2.5 Blanking module and dummy module specifications comparison ..... 3 - 115
3.3 Precautions for I/O Module Replacement ..... 3 - 116

CHAPTER 4 POWER SUPPLY MODULE REPLACEMENTS 4 - 1 to 4 - 9

4.1 List of Alternative Models for Power Supply Module ..... 4 - 1
4.2 Power Supply Module Specifications Comparisons ..... 4 - 2
4.3 Precautions for Power Supply Module Replacement ..... 4 - 9

CHAPTER 5 BASE UNIT AND EXTENSION CABLE REPLACEMENT 5 - 1 to 5 - 34

5.1 List of Alternative Models for Base Unit and Extension Cable ..... 5 - 1
5.2 Base Unit and Extension Cable Specifications Comparison ..... 5 - 2
5.2.1 Base unit specifications comparison ..... 5 - 2
5.2.2 Extension cables specifications comparison ..... 5 - 4
5.3 Precautions for Base Unit and Extension Cable Replacement ..... 5 - 5
5.3.1 Precautions for base unit replacement ..... 5 - 5
5.3.2 Precautions for extension cable replacement ..... 5 - 5
5.4 QA(1S) Extension Base Unit ..... 5 - 6
5.4.1 QA(1S) extension base unit specifications ..... 5 - 6
5.4.2 Applicable QCPU ..... 5 - 6
5.4.3 Extension cable ..... 5 - 7
5.4.4 System configuration ..... 5 - 7
5.4.5 System equipment list ..... 5 - 9
5.4.6 I/O address for the QA(1S) extension base unit and QA conversion adapter ..... 5 - 11
5.4.7 External dimensions ..... 5 - 12
5.5 A-A1S Module Conversion Adapter ..... 5 - 15
5.5.1 System configuration ..... 5 - 15
5.5.2 Modules which can use the A-A1S module conversion adapter (A1ADP) ..... 5 - 16
5.5.3 Precautions for using A-A1S module conversion adapter (A1ADP) ..... 5 - 19
5.6 Q Series Large Type Base Unit and Q Series Large Type I/O Module ..... 5 - 21
5.6.1 Specifications ..... 5 - 21
5.6.2 Applicable programmable controller ..... 5 - 31
5.6.3 Modules that cannot be mounted on the Q series large type base unit ..... 5 - 31
5.6.4 Precautions for using the Q series large type base unit and large type I/O module ..... 5 - 32
5.6.5 External dimensions ..... 5 - 33

CHAPTER 6 MEMORY AND BATTERY REPLACEMENT 6 - 1 to 6 - 2

6.1 List of Alternative Models for Memory ..... 6 - 1
6.2 Precautions for Memory and Battery Replacement ..... 6 - 2

CHAPTER 7 PROGRAM REPLACEMENT 7 - 1 to 7 - 49

7.1 Program Replacement Procedure ..... 7 - 4
7.1.1 Program conversion procedure from ACPU to QCPU ..... 7 - 4
7.1.2 Changing programmable controller type ..... 7 - 5
7.1.3 ACPU program conversion ratio ..... 7 - 8
7.1.4 Reading (Reusing) other format files ..... 7 - 10
7.2 Instruction Conversion ..... 7 - 13

7.2.1 List of instructions conversion from ACPU to QCPU (Sequence/Basic/Application instructions) 7 - 13
7.2.2 List of instruction conversion from ACPU to QCPU (Dedicated instructions) ..... 7 - 18
7.2.3 Instructions that may need a replacement at instruction conversion from ACPU to QCPU ... 7 - 21
7.2.4 Instruction conversion from QnACPU to QCPU ..... 7 - 25
7.2.5 Instructions that may need a replacement after conversion from QnACPU to QCPU ..... 7 - 25
7.3 Precautions for Parameter Replacement ..... 7 - 26
7.3.1 Conversion from ACPU to QCPU ..... 7 - 26
7.3.2 Conversion from QnACPU to QCPU ..... 7 - 27
7.4 Special Relay Replacement ..... 7 - 29
7.4.1 Replacing the ACPU with the QCPU ..... 7 - 29
7.4.2 Replacing the QnACPU with the QCPU ..... 7 - 29
7.5 Special Register Replacement ..... 7 - 30
7.5.1 Replacing the ACPU with the QCPU ..... 7 - 30
7.5.2 Replacing the QnACPU with the QCPU ..... 7 - 30
7.6 Precautions for Replacing the MELSAP-II with the MELSAP3 ..... 7 - 31
7.6.1 Starting SFC program ..... 7 - 31
7.6.2 Block information (SFC information device) ..... 7 - 31
7.6.3 Specifications comparison between MELSAP-II and MELSAP3 ..... 7 - 32
7.6.4 Specifications comparison of MELSAP3 between QnACPU and QCPU ..... 7 - 33
7.6.5 SFC diagram that cannot be read normally in another format ..... 7 - 34
7.7 Precautions for Program Replacement ..... 7 - 35
7.7.1 List of applicable devices ..... 7 - 35
7.7.2 I/O control method ..... 7 - 38
7.7.3 Usable data format for instructions ..... 7 - 38
7.7.4 Timer ..... 7 - 39
7.7.5 Counter ..... 7 - 40
7.7.6 Display instructions ..... 7 - 40
7.7.7 Index register ..... 7 - 41
7.7.8 Instructions where format is changed (Excluding AnACPU/AnUCPU dedicated instructions) ..... 7 - 43
7.7.9 AnACPU/AnUCPU dedicated instruction ..... 7 - 44
7.7.10 Setting method when multiple sequence programs are created ..... 7 - 45
7.7.11 Precautions for file register replacement ..... 7 - 48
7.7.12 Boot run method (Writing programs to ROM) ..... 7 - 49

CHAPTER 8 EXTERNAL DIMENSIONS 8 - 1 to 8 - 3

8.1 Q Series External Dimensions and Mounting Dimensions ..... 8 - 1
8.2 Q Series External Dimensions and Mounting Dimensions when Mounted with the Upgrade Tool .. 8 - 2
8.3 A Series External Dimensions and Mounting Dimensions ..... 8 - 3

APPENDICES App - 1 to App - 17

Appendix 1 Basic Model QCPU ..... App - 1
Appendix 1.1 Major restrictions ..... App - 1
Appendix 1.2 CPU module specifications comparison ..... App - 3
Appendix 1.3 CPU module functional comparison ..... App - 5

Appendix 2 Spare Parts Storage ..... App - 11
Appendix 3 Related Manuals ..... App - 12
Appendix 3.1 Materials for replacement ..... App - 12
Appendix 3.2 A/QnA series ..... App - 13
Appendix 3.3 Q series ..... App - 15
Appendix 3.4 Programming too ..... App - 16
Appendix 3.5 Products manufactured by Mitsubishi Electric Engineering Co., Ltd. ..... App - 17
Appendix 3.6 Products manufactured by Mitsubishi Electric System & Service Co., Ltd. ..... App - 17

- For the products shown in handbooks for transition, Catalogue, and transition examples, refer to the manuals for the relevant products and check the detailed specifications, precautions for use, and restrictions before replacement.
  For the products manufactured by Mitsubishi Electric Engineering Co., Ltd., Mitsubishi Electric System & Service Co., Ltd., and other companies, refer to the catalogue for each product and check the detailed specifications, precautions for use, and restrictions before use.
  The manuals and catalogues for our products, products manufactured by Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Electric System & Service Co., Ltd., are shown in Appendix of each handbook for transition.

- For details on product compliance with the above standards, please contact your local Mitsubishi Electric sales office or representative.

- Products shown in this handbook are subject to change without notice.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this handbook uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
■Series	
A series	Abbreviation for large types of Mitsubishi MELSEC-A series programmable controllers
AnS series	Abbreviation for compact types of Mitsubishi MELSEC-A series programmable controllers
A/AnS series	Generic term for A series and AnS series
QnA series	Abbreviation for large types of Mitsubishi MELSEC-QnA series programmable controllers
QnAS series	Abbreviation for compact types of Mitsubishi MELSEC-QnA series programmable controllers
QnA/QnAS series	Generic term for QnA series and QnAS series
A/AnS/QnA/QnAS series	Generic term for A series, AnS series, QnA series, and QnAS series
Q series	Abbreviation for Mitsubishi MELSEC-Q series programmable controllers
■CPU module type	
CPU module	Generic term for A series, AnS series, QnA series, QnAS series, and Q series CPU modules
Basic model QCPU	Generic term for the Q00JCPU, Q00CPU, and Q01CPU
High Performance model QCPU	Generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU * This handbook mainly explains about the Q02CPU, Q02HCPU, Q06HCPU, and Q12HCPU.
Process CPU	Generic term for the Q02PHCPU, Q06PHCPU, Q12PHCPU, and Q25PHCPU
Redundant CPU	Generic term for the Q12PRHCPU and Q25PRHCPU
Universal model QCPU	Generic term for the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q50UDEHCPU, and Q100UDEHCPU * This handbook mainly explains about the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, and Q06UDHCPU, which can replace the AnS/QnAS series. The specifications and functions of the Q10UDEHCPU to Q100UDEHCPU are the same as those of the modules described above, although the program and memory capacities increase.
■CPU module model	
ACPU	Generic term for the MELSEC-A series CPU modules
AnSCPU	Generic term for the MELSEC-AnS series CPU modules
AnNCPU	Generic term for the A1NCPU, A1NCPUP21/R21, A1NCPUP21-S3, A2NCPU, A2NCPU-S1, A2NCPUP21/R21, A2NCPUP21/R21-S1, A2NCPUP21-S3(S4), A3NCPU, A3NCPUP21/R21, and A3NCPUP21-S3
AnACPU	Generic term for the A2ACPU, A2ACPU-S1, A3ACPU, A2ACPUP21/R21, A2ACPUP21/R21-S1, and A3ACPUP21/R21
AnUCPU	Generic term for the A2UCPU, A2UCPU-S1, A3UCPU, A4UCPU, A2USCPU, A2USCPU-S1, and A2USHCPU-S1
AnUS(H)CPU	Generic term for the A2USCPU, A2USCPU-S1, A2USHCPU-S1
A/AnSCPU	Generic term for MELSEC-A series and MELSEC-AnS series programmable controller CPUs
AnN/AnACPU	Generic term for the AnNCPU and AnACPU
AnN/AnA/AnSCPU	Generic term for the AnNCPU, AnACPU, and AnSCPU
QnACPU	Generic term for the MELSEC-QnA series CPU modules
QnASCPU	Generic term for the MELSEC-QnAS series CPU modules
QnA/QnASCPU	Generic term for the QnACPU and QnASCPU
A/AnS/QnA/QnASCPU	Generic term for the ACPU, AnSCPU, QnACPU, and QnASCPU
QCPU	Generic term for the MELSEC-Q series CPU modules

1 INTRODUCTION

1.1 Considerations before Selection of Alternative Models for Replacement

This transition handbook describes the model selection of CPU modules and I/O modules after replacing models, for the transition from the MELSEC-A/QnA (large type) series to the Q series.
At the transition from MELSEC-A/QnA (large type) series to Q series, some items such as the replacement procedure, installation location, specifications comparisons between existing modules and replaced modules, and replacement method are required to be considered beforehand.
The following shows major options. Consider them sufficiently in advance. (It is necessary to understand the existing system configuration before making considerations.)

(Major items required to be considered in advance)

1) **Replacement methods and installation location**
   a) Whether gradual replacement (only the CPU module is replaced with Q series, etc.) or batch replacement for the replacement method of the existing system. When replacing it gradually, which existing modules should be leveraged (left).
   b) Whether some space can be reserved when adding a base unit at the replacement work.
2) **Replacement schedule**
3) **Model selection after replacing models (I/O module)**
   a) Whether a module whose specifications (rated input current, etc.) and functions are equivalent to that of the existing module exists or not in the Q series.
   b) Whether utilizing the existing modules continuously or replacing them with Q series modules.
   c) Whether utilizing the existing external wiring or wiring newly.
4) **Model selection after replacing models (intelligent function module (analog, high-speed counter module, etc.))**
   a) Whether the specifications of replaced modules and connection external device match or not.
5) **Model selection after replacing models (communication module (computer link module, Ethernet module etc.))**
   a) Whether the communication target device is compatible with the Q series module commands in the communication using the MC protocol or not.
   b) Whether the communication target device software (program) can be changed to Q series CPU-compatible or not.

6) **Model selection after replacing models (network module (MELSECNET (II), MELSECNET/MINI(-S3)))**
   a) Whether the replacement of MELSECNET (II) is a gradual replacement or batch replacement for.
   b) Whether local stations and remote stations can be grouped into two networks, PLC-to-PLC network and remote I/O network, by replacing to MELSECNET/H when the local stations and remote stations are mixed in the existing MELSECNET (II).
   c) Whether a new communication cable installation has been considered or not at the replacement from MELSECNET/MINI(-S3) to CC-Link.

7) **Program utilization**
   a) Whether utilizing the program in the existing system or creating a new program.
   b) Whether the workload and cost of correction have been considered or not when utilizing the program of intelligent function module and communication module (nonprocedural mode).

Point

This transition handbook describes the transition from the A/QnA (large type) series to the Q series with the Universal model QCPU and the High Performance model QCPU.
To use the QA extension base unit with the Universal model QCPU, use the module with a serial number (first five digits) of "13102" or later.

When using the following modules with the Universal model QCPU, there is no difference from when using them with the High Performance model QCPU.

- I/O module
- Intelligent function module
- Communication module
- MELSECNET/10 network module
- MELSECNET/H network module

1.2 Suggestions for Transition from the A/QnA (Large Type) Series to the Q Series

1.2.1 Advantages of transition to Q series

(1) Advanced performance of equipments (Tact time reduction).

The Q series includes faster operation processing speed, faster bus speed and dual processors of Super MSP (MELSEC SEQUENCE PROCESSOR) and general-purpose processor to provide approximately 5 times more efficient processing than the A series. This realizes more advanced performance of equipments.

(2) Compact control panel and space saving

Comparing to the large-sized A series, the Q series requires one-fourth mounting area, which allows installing a compacted control panel.

(3) Improved maintainability

(a) The high-speed program ports (USB port and high-speed serial port) enable the program reading/writing time to be greatly reduced, resulting in improvement of on-site maintainability.

(b) As standard ROM (Flush ROM) is built-in the Q series, ROM operation can be performed (Without Battery) without a memory card.

(c) As large files can be managed, it is possible to store conventional programs as correction history in memory.

(4) Easy control of information

A Web server module facilitates the factory informatization required in the future, such as monitoring and operating equipment remotely, collecting data for quality control, and obtaining data for traceability. (There is no A series Web server module.)

☒Point

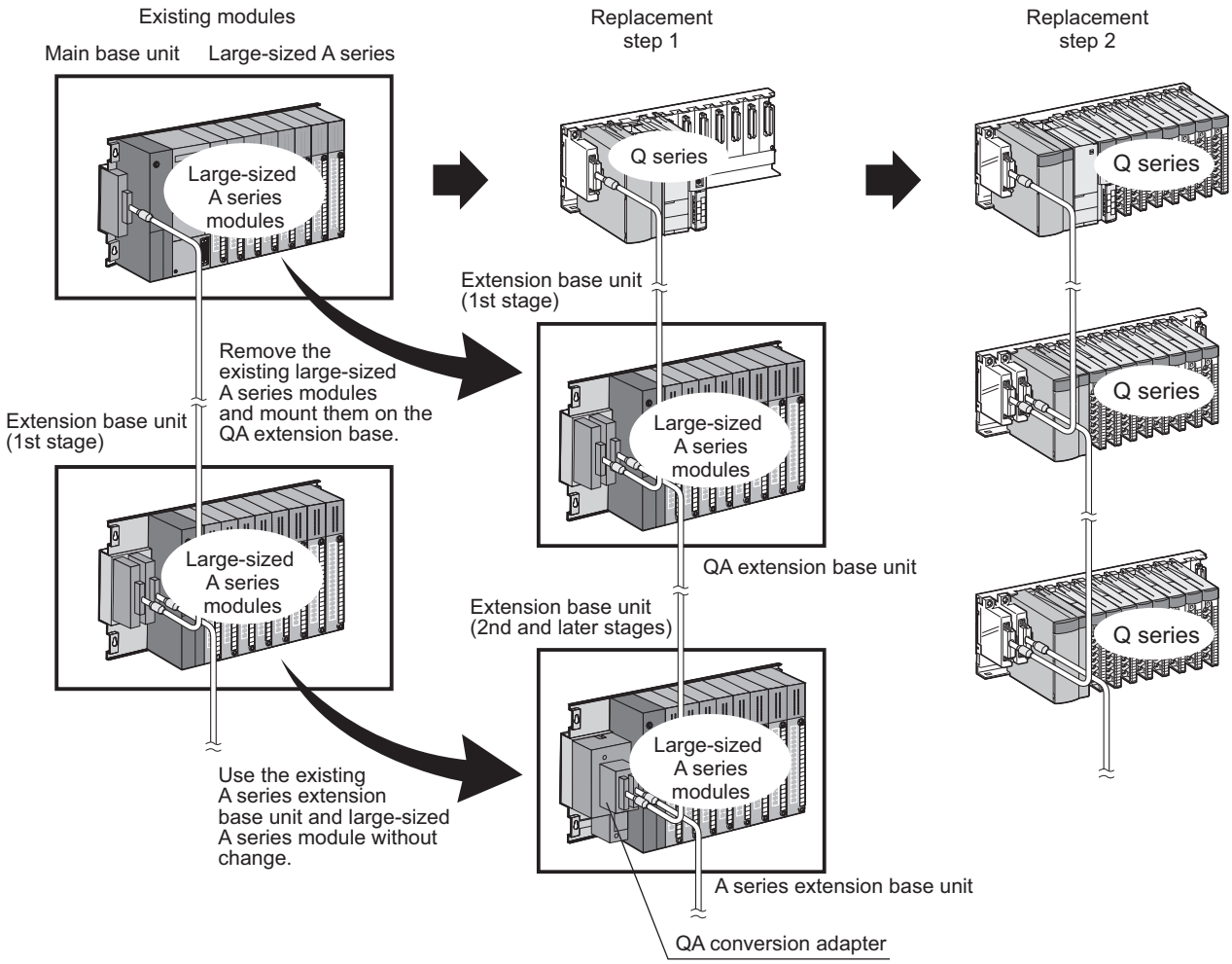
Web server module is a module equipped with an RS-232 interface for connecting to a 100BASETX/10BASE-T Ethernet interface or modem.
Using the Web server function, users can monitor the programmable controller CPU, log data, write data to the programmable controller CPU, and notify an event via the Internet or intranet.
For the Web server module, refer to the following.
☞Web Server Module User's Manual

1.2.2 Suggestions for transition to Q series

(1) Replacing the CPU module with the QCPU, and replacing existing modules with the Q series modules in series with utilizing the existing large-sized A series module

Method : Replace the modules gradually by using the QA extension base unit (QA6☐B) and utilizing the property of the large-sized A series.

Advantage: The cost and workload for the transition can be divided, and yet the function extension can be continued during the transition.



(a) The QA extension base unit models are "QA6☐B" for the large-sized series, and "QA1S51B" and "QA1S6☐B" for the small-sized series.
When replacing the AnS/Q2AS small-sized series, the A series small-sized module can be utilized.
The QA1S51B is not extendable. Since the QA1S51B does not have an extension cable connector (OUT), it cannot be used with the QA6☐B or QA6ADP+A5☐B/A6☐B.

(b) By mounting the QA conversion adapter, existing A series extension base unit can be used as the extension base unit for the replaced QCPUs. (Since it is equivalent to the QA extension base unit, the precautions for the mountable module are the same as that of the QA extension base unit.)

(c) When utilizing existing A series module using QA extension base, programs can be utilized without changing the existing I/O address with I/O assignment setting in PLC parameter.
For details of I/O address setting method with I/O assignment, refer to Section 5.4.6.

Point

The QA extension base unit can be used with the High Performance model QCPU or the Universal model QCPU with a serial number (first five digits) of "13102" or later.
For details and precautions of the QA extension base unit, refer to Section 5.4.

Replacement procedures:

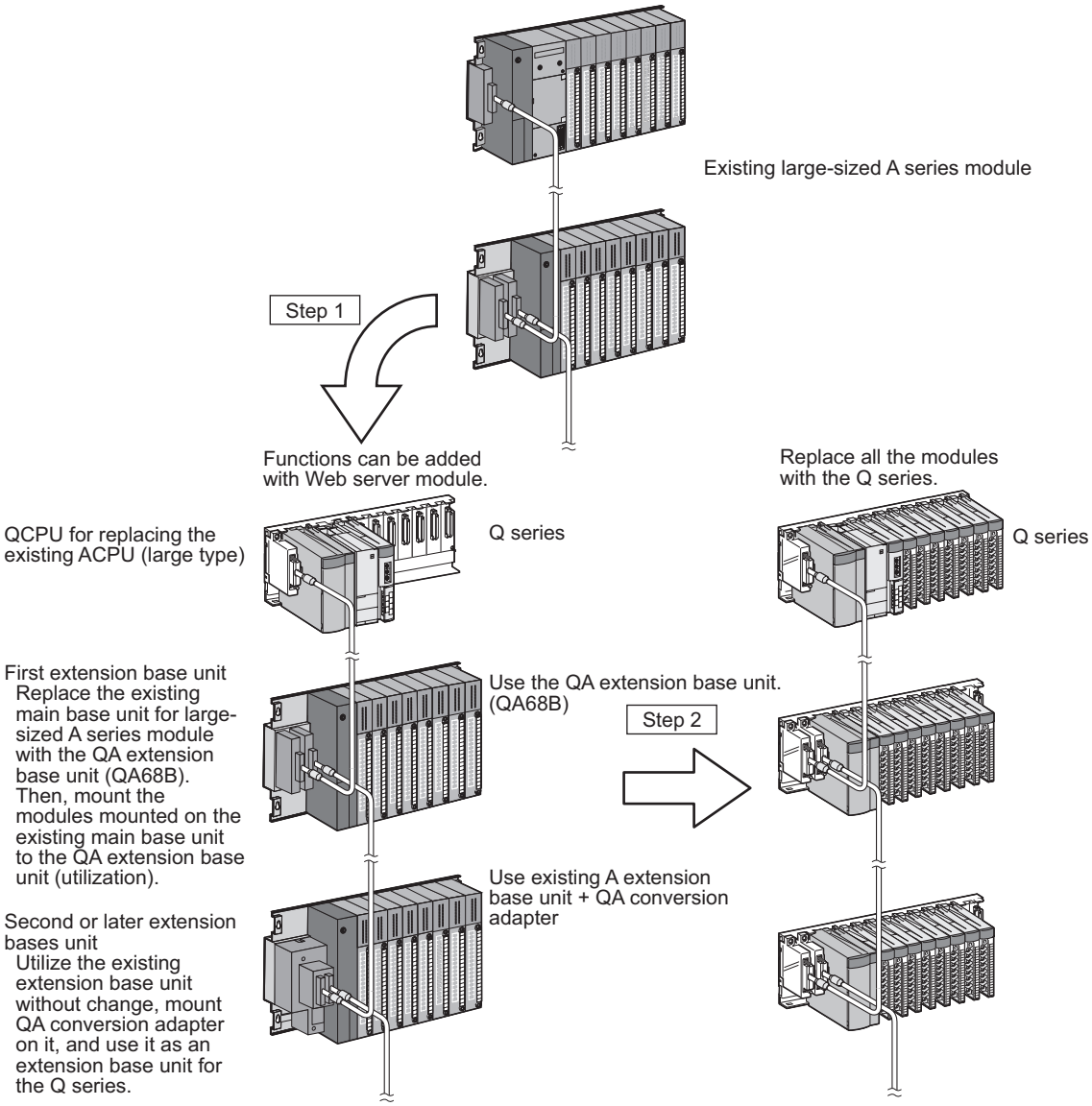
Step 1

- Mount the QCPU and a module for function expansion on the Q series main base unit. Connect the QA extension base unit (QA65B) to the main base unit as the first extension base unit and mount the power supply module and I/O module which are installed to the existing large-sized A main base unit series on it. (Wiring change is unnecessary.) Mount the QA conversion adapters (QA6ADP) on after the first extension base units, and utilize the existing extension base unit, power supply module, and I/O module for large-sized A series to a system after replacement.
- Programs are automatically converted* by changing the programmable controller type from ACPU to QCPU using GX Developer.

  * Some instructions are not automatically converted. In case of intelligent function module or network module, programs and parameters need be changed.

Step 2

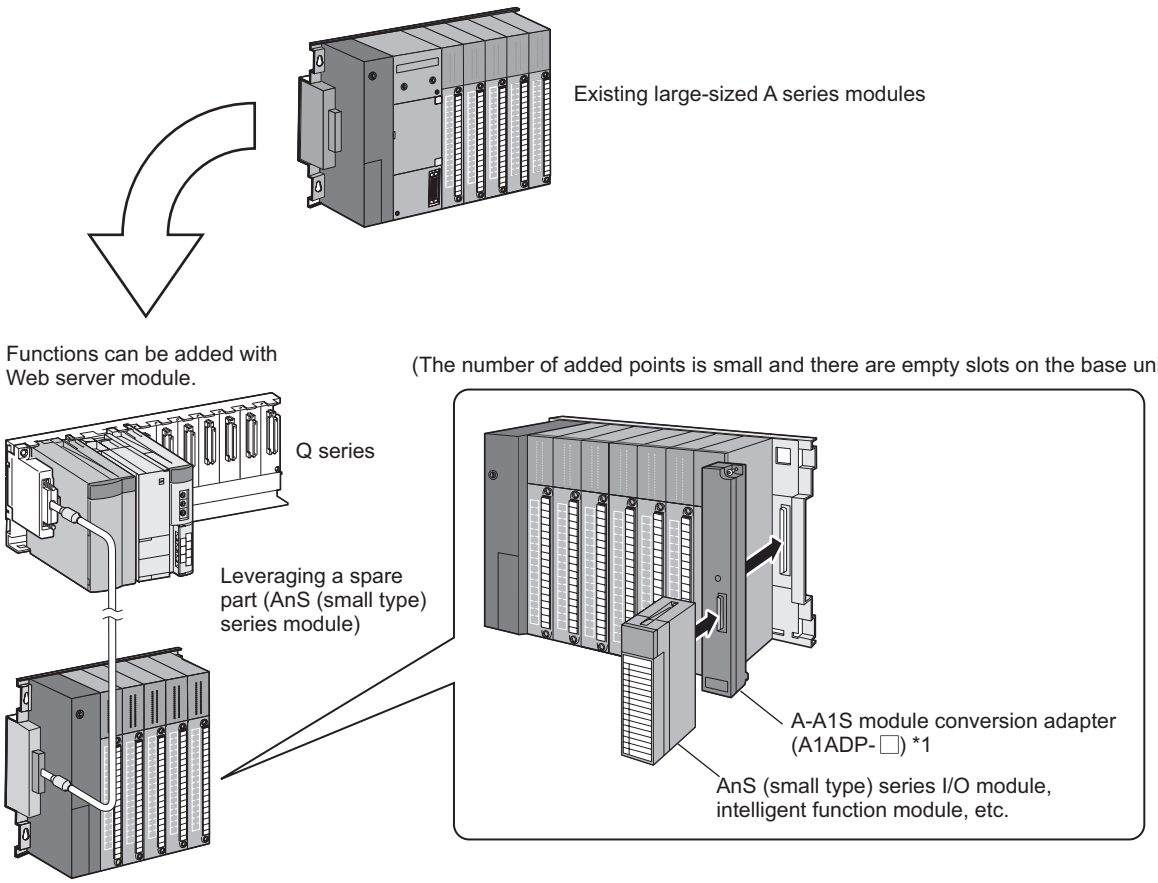
Replace the existing modules mounted on the QA extension base unit and the A series extension base unit + QA conversion adapter with the Q series modules in series. Remove the QA extension base unit and A series extension base unit after replacing all the modules.



(2) Leveraging a spare part (AnS (small type) series module) when utilizing the existing modules using the QA extension base

Method : Use a spare part, AnS (small type) series module, (a module substitutes for large-sized A series module) with A-A1S module conversion adapter (A1ADP)*1.

Advantage: Spare part having the functions equivalent to the module before replacement.

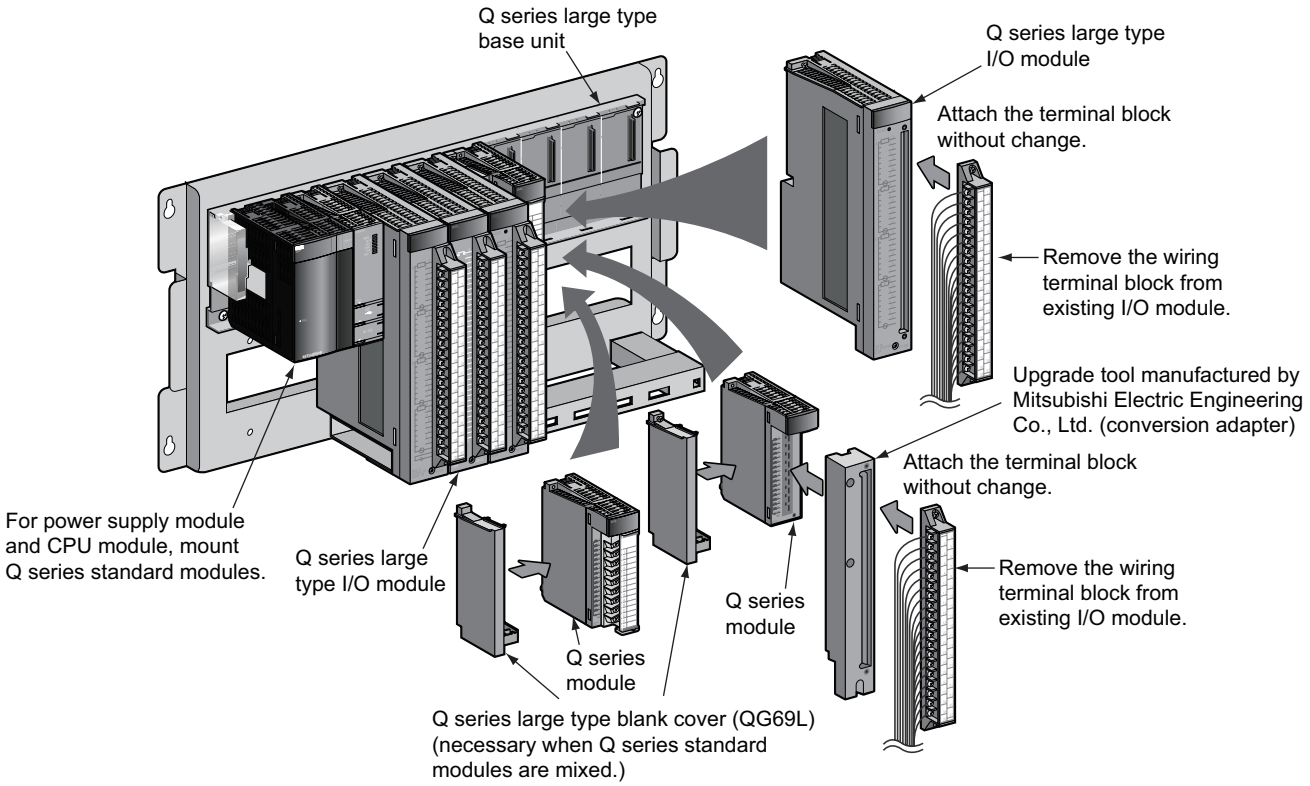


*1 For details of A-A1S module conversion adapter (A1ADP), refer to Section 5.5.

(3) Leveraging the Q series large type base unit and Q series large type I/O module

Method : Using the Q series large type base unit and Q series large type I/O module[*1], attach the 32-point terminal block used for existing A series I/O module without changing external wiring.

Advantage: Changing the existing external wiring and processing the mounting hole of the Q series large type base unit are unnecessary. Moreover, Q series modules are mountable.



(a) The 32-point terminal block used for the A/QnA series can be attached to the Q series large type I/O module without changing external wiring. This permits eliminating wiring change when replacing the A/QnA series.

(b) The Q series large type I/O module has performance specifications equivalent to the A/QnA series.

(c) Since the A/QnA series base unit has the same mounting dimensions with the Q series large type base unit, the mounting holes can be utilized.

(d) The Q series large type I/O module and Q series module can be mounted together on the Q series large type base unit.
The upgrade tool[*2] manufactured by Mitsubishi Electric Engineering Co., Ltd. (hereafter, abbreviated as upgrade tool) can be mounted on the Q series module, and a connector and terminal block used with the A/QnA series can be used without wiring change. (Refer to the figure above.)

*1 For details of the Q series large type base unit and Q series large type I/O module, refer to Section 5.6.

*2 For products manufactured by Mitsubishi Electric Engineering Co., Ltd., contact your local sales representative.

Point

Available alternative models

(1) When using the Q series large type base unit

Product	Model		Remarks
	Existing large-sized A series module	Q series large type module	
Main base unit	A38B	Q38BL	Refer to Section 5.6.
	A35B	Q35BL	
Extension base unit	A68B	Q68BL	
	A65B	Q65BL	
	A55B	Q55BL	

(2) When using the Q series large type I/O module

Product	Model		Remarks
	Existing large-sized A series module	Q series large type module	
Input module	AX11	QX11L	Refer to Section 5.6.
	AX21	QX21L	
Output module	AY10A AY11A	QY11AL	
	AY13	QY13L	
	AY23	QY23L	
	AY51	QY51PL	
	AY51-S1		

(3) When using the upgrade tool (conversion adapter)

(a) For I/O module

Product	Model		Conversion adapter model	Q series shape
	Existing large-sized A series module	Q series module		
Input module	AX10	QX10	ERNT-AQTX10	Terminal block (18 points)
	AX40	QX40 QX40-S1	ERNT-AQTX40	
	AX70	QX70		
	AX50	QX50		
	AX50-S1			
	AX80	QX80	ERNT-AQTX80	
	AX41	QX41	ERNT-AQTX41	FCN connector (40P)
	AX31-S1	QX41-S2		
	AX41-S1	QX41-S1		
	AX71	QX71		
	AX81	QX81	ERNT-AQTX81	D-Sub connector (37P)
	AX81-S1	QX81-S2		
Output module	AY10	QY10	ERNT-AQTY10	Terminal block (18 points)
	AY11			
	AY11E			
	AY11EEU			
	AY22	QY22	ERNT-AQTY22	
	AY40	QY40P	ERNT-AQTY40	
	AY40P			
	AY70	QY70		
	AY50	QY50	ERNT-AQTY50	
	AY80	QY80	ERNT-AQTY80	
	AY41	QY41P	ERNT-AQTY41	FCN connector (40P)
	AY41P			
	AY71	QY71		
	AY81	QY81P	ERNT-AQTY81	D-Sub connector (37P)
	AY81EP			

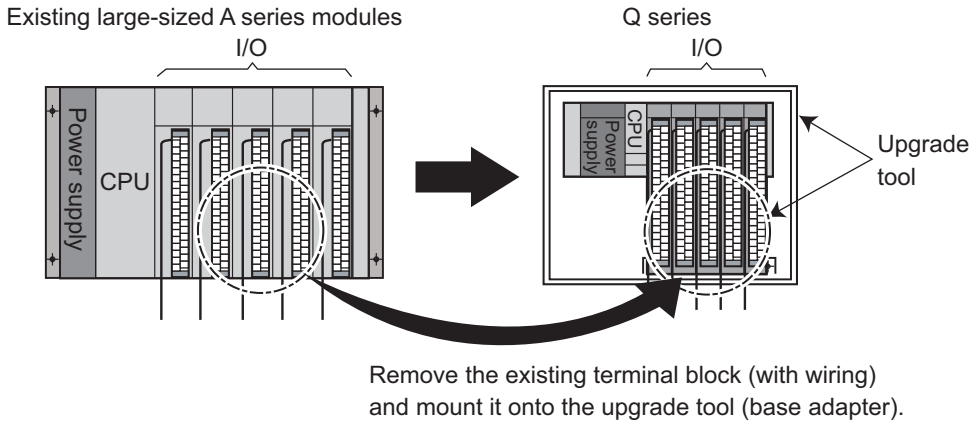
(b) For analog module/High-speed counter module

Product	Model		Conversion adapter model	Q series shape
	Existing large-sized A series module	Q series module		
Analog input module	A68AD*1	Q68ADV Q68ADI	ERNT-AQT68AD	Terminal block (18 points)
	A68AD-S2*1			
	A68ADN*1			
Analog output module	A62DA	Q62DAN	ERNT-AQT62DA	
	A62DA-S1			
	A68DAV	Q68DAVN	ERNT-AQT68DA	
	A68DAI	Q68DAIN		
	A68DAI-S1			
High-speed counter module	AD61	QD62	ERNT-AQTD61	FCN connector (40P)
		QD62-H01		
	AD61-S1	QD62-H02		

*1 Voltage input or current input for the replacing Q series module
When using the existing large-sized A series module with voltage/current mixed input, the replacement with the Q series large type base unit and conversion adapter is not possible.
Consider the replacement to the Q64AD-GH (using two modules) by leveraging the 2-slot type conversion adapter, etc.

(4) Transition to Q series by utilizing existing wiring

Method: Use the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. and the existing mounting hole/terminal block wiring.
Advantage: No need to process additional holes, and the existing wiring is usable.



Remarks

Upgrade tool for transition from the A series to the Q series released from Mitsubishi Electric Engineering Co., Ltd. is composed of the following products.

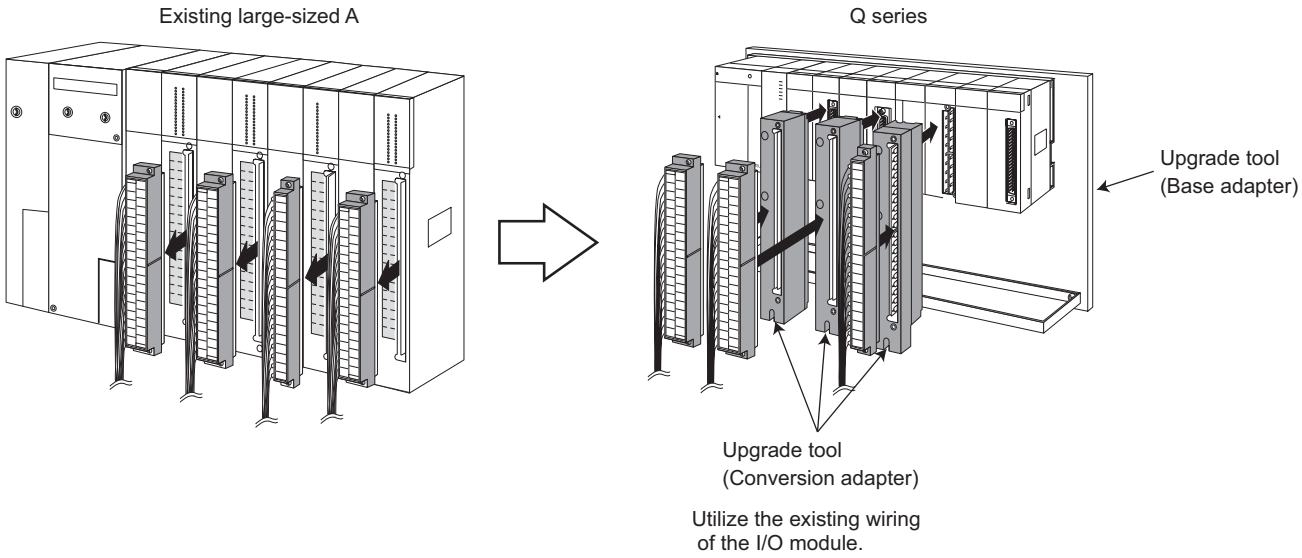
- Conversion adapter for changing the existing wiring connected to the A series I/O module to wiring for the Q series I/O module
- Conversion adapter fixing stand for fixing the bottom of the conversion adapter
- Base adapter which utilizes the mounting hole of the MELSEC-A series base unit for mounting MELSEC-Q series module

For example, using the conversion adapter allows utilizing the wiring connected to the A series I/O module for the Q series module without change.(32-point module terminal block for the A series can be attached to two Q series 16-point modules.)
Note that the conversion adapter cannot be mounted depending on the size of used wire. In that case, take measures such as making the left side slot empty.
For details, refer to the catalog of the upgrade tool.

Replacement procedures:

- Remove the existing large-sized A series modules together with the base unit, and use the existing mounting holes to mount the upgrade tool (Base adapter) manufactured by Mitsubishi Electric Engineering Co., Ltd. Then mount the Q series. (By mounting the base adapter, it is not necessary to redo the mounting holes.)
- Mount the upgrade tool (Conversion adapter) manufactured by Mitsubishi Electric Engineering Co., Ltd. on the mounted Q series I/O modules.
- Remove the terminal blocks wired from the existing large-sized A series I/O modules, and mount the blocks on the conversion adapter. (The existing wiring is usable.)
- Programs are automatically converted* by changing the programmable controller type from ACPU to QCPU using GX Developer. Even if the module arrangement is changed, the I/O can be assigned to the same number as before, which cuts out the need to modify the programs and slot number for I/O module.

  * Some instructions are not automatically converted. In case of intelligent function module or network module, programs and parameters need be changed.



Point

(1) Conversion adapter

(a) 1-slot type (Mountable to Q Series large type base unit)

Separate adapters for I/O modules, analog modules, and high speed modules are available respectively.

Refer to Section 1.2.2 (3) Point.

(b) 2-slot type (Not mountable to Q Series large type base unit)

1) For I/O module

Input/Output	MELSEC-A Series module model	MELSEC-Q Series module model	Conversion adapter (2-slot type)		
			Model	Shape	
				MELSEC-A Series	MELSEC-Q Series
Input	AX11*1	QX10 × 2 modules	ERNT-AQTX11	Terminal block (38-points)	Terminal block (18-points) × 2 modules
	AX11EU*1				
Output	AY10A*2	QY18A × 2 modules	ERNT-AQTY10A		
	AY11A*2				
	AY11AEU*2				
	AY13*3	QY10 × 2 modules	ERNT-AQTY13		
	AY13E*3				
	AY13EU*3				
	AY23*4	QY22 × 2 modules	ERNT-AQTY23		
	AY51*5	QY50 × 2 modules	ERNT-AQTY51		
	AY51-S1*5				
	AY81	QY80 × 2 modules			
	AY81EP				

*1 Replaceable with Q Series large type input module QX11L.

*2 Replaceable with Q Series large type output module QY11AL.

*3 Replaceable with Q Series large type output module QY13L.

*4 Replaceable with Q Series large type output module QY23L.

*5 Replaceable with Q Series large type output module QY51PL.

2) For analog module

Input/Output	MELSEC-A Series module model	MELSEC-Q Series module model	Conversion adapter (2-slot type)		
			Model	Shape	
				MELSEC-A Series	MELSEC-Q Series
Input	A68AD (Voltage/Current mixed input)	Q64AD-GH × 2 modules*	ERNT-AQT68AD-GH	Terminal block (38-points)	Terminal block (18-points) × 2 modules
	A68AD-S2 (Voltage/Current mixed input)				
	A68ADN (Voltage/Current mixed input)				
	A616AD (Voltage input)	Q68ADV × 2 modules	ERNT-AQT616AD		
	A616AD (Current input)	Q68ADI × 2 modules			
Output	A616DAV	Q68DAVN × 2 modules	ERNT-AQT616DA		
	A616DAI	Q68DAIN × 2 modules			

* When using mixed voltage/current input for existing A Series module.
The 1-slot type conversion adapter can be used when using voltage input only or current input only.

(2) Compatibility of Q Series large type base unit with the upgrade tool

The following table shows the compatibility of Q Series large type base unit with the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. when replacing existing A Series modules with Q Series modules.

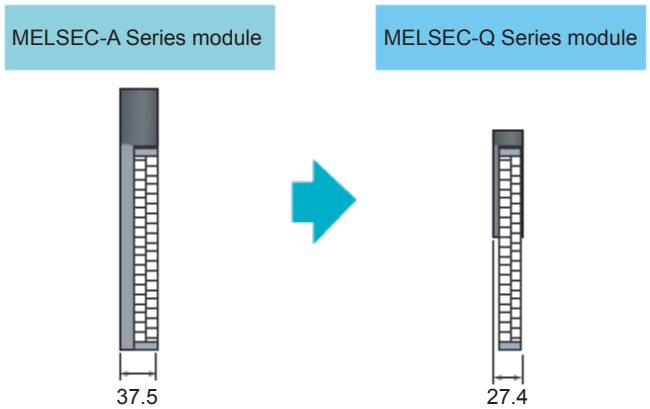
Item			Q Series large type base unit*1	Base adapter Conversion adapter (Upgrade tool)*2
Slot width of base unit*3			Same width as the A Series base unit (37.5 mm)	Same width as Q Series base unit (27.4 mm)
Mountable module	Power supply module	Q Series standard power supply module	○	○
	CPU module	Basic model QCPU	×	○
		High Performance model QCPU	○	○
		Process CPU	×	○
		Universal model QCPU	○*4	○
	• I/O module • Intelligent function module	Q Series large type I/O modules*5	○	×
		Q Series module (occupies 1 slot)	○*7	○
		Q Series module (occupies 2 slots)	×	○
Conversion adapter*6	For terminal block type 16-point I/O module (occupies 1 slot)		○*7	○
	For terminal block type 32-point I/O module (occupies 1 slot)		○*7	△*9
	For terminal block type 32-point I/O module (occupies 2 slots)		×	△*10
	For high-speed counter module		○*7	△*9
	For analog module (occupies 1 slot)		○*7	△*9
	For analog module (occupies 2 slots)		×	△*10
Connection of QA/QA1S extension base unit*8			○	○

○: Applicable (Mountable), △: Applicable with restrictions (Mountable), ×: Not Applicable (Not mountable)

*1 Q Series large type base units can be used with Q Series base units (standard products).

*2 Mount a Q Series base unit (standard product) on the base adapter manufactured by Mitsubishi Electric Engineering Co., Ltd.

*3 Check mounting conditions before using the upgrade tool, because wiring space is reduced due to a decrease in the module's width.



*4 Q00UJCPU is not compatible.

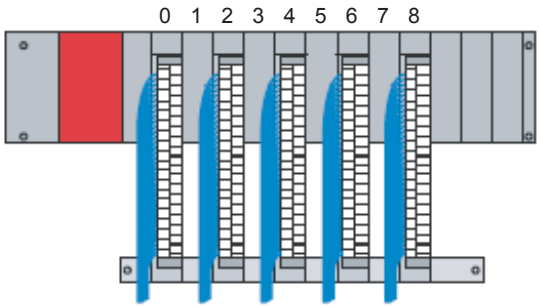
*5 Number of common points and electrical specifications are same as that of large type A Series I/O module.

*6 Since the adapters are mounted on Q Series modules, the specifications and functions are same as those of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from those of large type A Series module)

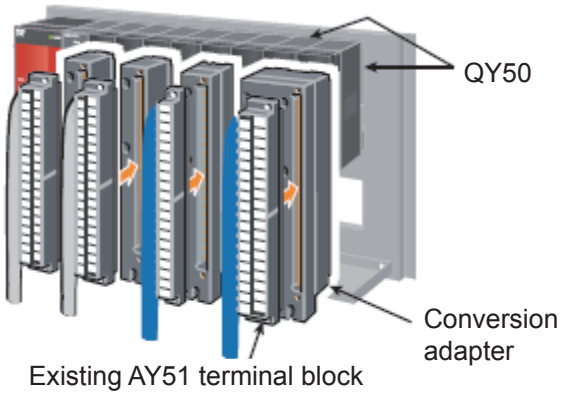
*7 Q Series large type blank cover (QG69L) is required.

*8 The QA/QA1S extension base unit can be used with the High Performance model QCPU or the Universal model QCPU with a serial number (first five digits) of "13102" or later.

*9 If the size of the wire connected to the terminal block is larger than 1.25mm^2, ERNT-AQTX41, AQTY41, AQTX81, AQTY81, AQT68AD, AQT68ADN, AQT68DA, and AQTD61 modules may be difficult to mount.
In this case, secure wiring space by leaving empty slots in between modules. For example, mount modules on slot No. 0, 2, 4, 6, 8, and leave slot No. 1, 3, 5, 7 empty. If the number of slots is insufficient, consider using the Q Series large type base unit.



*10 To be used when replacing the AY51 with two QY50 modules and a conversion adapter. Or, when replacing the A616AD with two Q68ADV(I) modules and a conversion adapter.
In both cases, the existing wired terminal blocks can be used.



For MELSEC-A/QnA(large type) Series to Q Series transition related products manufactured by Mitsubishi Electric Engineering Co., Ltd. or Mitsubishi Electric System & Service Co., Ltd., contact your local sales office or representative.

1.2.3 Precautions for transition from large-sized A/QnA series to Q series

(a) Before replacing the A/QnA (large type) series by the Q series, be sure to refer to manuals for each Q series module to check the functions, specifications, and usage.

(b) For products manufactured by Mitsubishi Electric Engineering Co., Ltd. and Mitsubishi Electric System & Service Co., Ltd., refer to the catalog for each product shown in Appendix to develop an understanding of the detailed specifications, precautions and restrictions for use for correct usage.

(c) After replacing the A/QnA (large type) series by the Q series, be sure to check operations of the whole system before the actual operation.

2 CPU MODULE REPLACEMENT

2.1 List of Alternative CPU Module Models for Replacement

The following table lists alternative models of the Q series CPU module decided depending on the program capacity, number of I/O points, and functions of the A series CPU modules.
Select the most suitable model in light of the control targets of the A series CPU module, specifications and extendability of a system after replacement, and cost.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
CPU module	A1NCPU A1NCPUP21*1 A1NCPUR21*1 A1NCPUP21-S3*1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.079μs 3) PC MIX value: 0.2 → 4.4 4) I/O points: 256 points → 4096 points 5) I/O device points: 256 points → 8192 points 6) Program capacity: 6k steps → 28k steps 7) File register points: 0 point → 32k points (Using memory card: 1018k points) 8) Extension stage: 1 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: 4KRAM (Sold separately)/4KROM (Sold separately)/4KEROM (Sold separately) → Program memory/Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately) 10) Micro computer program: Available → Not available
		Q00UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.08μs 3) PC MIX value: 0.2 → 7.36 4) I/O points: 256 points → 1024 points 5) I/O device points: 256 points → 8192 points 6) Program capacity: 6k steps → 10k steps 7) File register points: 0 point → 64k points 8) Extension stage: 1 stage → 4 stage 9) Applicable memory: 4KRAM (Sold separately)/4KROM (Sold separately)/4KEROM (Sold separately) → Program memory/Standard RAM/Standard ROM 10) Micro computer program: Available → Not available

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A2NCPU A2NCPUP21*1 A2NCPUR21*1 A2NCPUP21-S3*1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.079μs 3) PC MIX value: 0.2 → 4.4 4) I/O points: 512 points → 4096 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 4k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately) 10) Micro computer program: Available → Not available
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.06μs 3) PC MIX value: 0.2 → 9.79 4) I/O points: 512 points → 1024 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 4k points → 64k points 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM 10) Micro computer program: Available → Not available
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.04μs 3) PC MIX value: 0.2 → 14 4) I/O points: 512 points → 2048 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 20k steps 7) File register points: 4k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM 10) Micro computer program: Available → Not available
	A2NCPU-S1 A2NCPUP21-S1*1 A2NCPUR21-S1*1 A2NCPUP21-S4*1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.079μs 3) PC MIX value: 0.2 → 4.4 4) I/O points: 1024 points → 4096 points 5) I/O device points: 1024 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 4k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately) 10) Micro computer program: Available → Not available
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.06μs 3) PC MIX value: 0.2 → 9.79 4) I/O points: 1024 points → 1024 points 5) I/O device points: 1024 points → 8192 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 4k points → 64k points 8) Extension stage: 7 stage → 4 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM 10) Micro computer program: Available → Not available
		Q03UDCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.0095μs 3) PC MIX value: 0.2 → 60 4) I/O points: 1024 points → 2048 points 5) I/O device points: 1024 points → 8192 points 6) Program capacity: 14k steps → 30k steps 7) File register points: 4k points → 96k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately) 10) Micro computer program: Available → Not available

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A3NCPU A3NCPUP21*1 A3NCPUR21*1 A3NCPUP21-S3*1	Q06HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.034μs 3) PC MIX value: 0.2 → 10.3 4) I/O points: 2048 points → 4096 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 4k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately) 10) Micro computer program: Available → Not available
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.04μs 3) PC MIX value: 0.2 → 14 4) I/O points: 2048 points → 2048 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 20k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately) 10) Micro computer program: Available → Not available
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.0095μs 3) PC MIX value: 0.2 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 20k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately) 10) Micro computer program: Available → Not available
	A2ACPU A2ACPUP21*1 A2ACPUR21*1 A2ACPUP21-S3*1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.079μs 3) PC MIX value: 0.9 → 4.4 4) I/O points: 512 points → 4096 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 8k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.06μs 3) PC MIX value: 0.9 → 9.79 4) I/O points: 512 points → 1024 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 8k points → 64k points 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.04μs 3) PC MIX value: 0.9 → 14 4) I/O points: 512 points → 2048 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 14k steps → 20k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A2ACPU-S1 A2ACPUP21-S1*1 A2ACPUR21-S1*1 A2ACPUP21-S4*1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.079μs 3) PC MIX value: 0.9 → 4.4 4) I/O points: 1024 points → 4096 points 5) I/O device points: 1024 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 8k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.06μs 3) PC MIX value: 0.9 → 9.79 4) I/O points: 1024 points → 1024 points 5) I/O device points: 1024 points → 1024 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 8k points → 64k points 8) Extension stage: 7 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM (Sold separately)
		Q03UDCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.0095μs 3) PC MIX value: 0.9 → 60 4) I/O points: 1024 points → 2048 points 5) I/O device points: 1024 points → 8192 points 6) Program capacity: 14k steps → 30k steps 7) File register points: 8k points → 96k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
	A3ACPU A3ACPUP21*1 A3ACPUR21*1 A3ACPUP21-S3*1	Q06HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.034μs 3) PC MIX value: 1.2 → 10.3 4) I/O points: 2048 points → 4096 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 64k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.04μs 3) PC MIX value: 1.2 → 14 4) I/O points: 2048 points → 2048 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.2 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 2048 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A2UCPU	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.079μs 3) PC MIX value: 0.9 → 4.4 4) I/O points: 512 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 8k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.06μs 3) PC MIX value: 0.9 → 9.79 4) I/O points: 512 points → 1024 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 8k points → 64k points 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.04μs 3) PC MIX value: 0.9 → 14 4) I/O points: 512 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 14k steps → 20k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
	A2UCPU-S1	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.079μs 3) PC MIX value: 0.9 → 4.4 4) I/O points: 1024 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 14k steps → 28k steps 7) File register points: 8k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q01UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.06μs 3) PC MIX value: 0.9 → 9.79 4) I/O points: 1024 points → 4096 points 5) I/O device points: 8092 points → 8192 points 6) Program capacity: 14k steps → 15k steps 7) File register points: 8k points → 64k points 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.04μs 3) PC MIX value: 0.9 → 14 4) I/O points: 1024 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 14k steps → 20k steps 7) File register points: 8k points → 64k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A3UCPU	Q06HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.034μs 3) PC MIX value: 1.2 → 10.3 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8092 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 64k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q03UDCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.2 → 60 4) I/O points: 2048 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 30k × 2 steps → 30k steps 7) File register points: 8k points → 96k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.2 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
	A4UCPU	Q12HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.034μs 3) PC MIX value: 1.2 → 10.3 4) I/O points: 4096 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately)
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.2 → 60 4) I/O points: 4096 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 30k × 2 steps → 60k steps 7) File register points: 8k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)
		Q13UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.2 → 60 4) I/O points: 4096 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 30k × 2 steps → 130k steps 7) File register points: 8k points →512k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Applicable memory: Depending on the memory cassette → Program memory/ Standard RAM/Standard ROM/memory card (Sold separately)

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	Q2ACPU	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.079μs 3) PC MIX value: 1.3 → 4.4 4) I/O points: 512 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 28k steps → 28k steps 7) File register points: 1018k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 3 stage → 7 stage (The QA extension base unit is connectable.) 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card
		Q02UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.04μs 3) PC MIX value: 1.3 → 14 4) I/O points: 512 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 28k steps → 20k steps 7) File register points: 1018k points → 32k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 4 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q03UDCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.0095μs 3) PC MIX value: 1.3 → 60 4) I/O points: 512 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 28k steps → 30k steps 7) File register points: 1018k points → 96k points (Using memory card: 4086k points) 8) Extension stage: 3 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
	Q2ACPU-S1	Q06HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.034μs 3) PC MIX value: 1.3 → 10.3 4) I/O points: 10242 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 60k steps → 60k steps 7) File register points: 1018k points → 32k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q03UDCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.0095μs 3) PC MIX value: 1.3 → 60 4) I/O points: 1024 points → 2048 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 60k steps → 30k steps 7) File register points: 1018k points → 96k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.2μs → 0.0095μs 3) PC MIX value: 1.3 → 60 4) I/O points: 1024 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 60k steps → 60k steps 7) File register points: 1018k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	Q3ACPU	Q12HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.034μs 3) PC MIX value: 1.3 → 10.3 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 92k steps → 124k steps 7) File register points: 1018k points → 128k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q04UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.3 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 92k steps → 40k steps 7) File register points: 1018k points → 128k points (Using memory card: 4096k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q13UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.3 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 92k steps → 130k steps 7) File register points: 1018k points → 512k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
	Q4ACPU	Q12HCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.075μs → 0.034μs 3) PC MIX value: 1.3 → 10.3 4) I/O points: 4096 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 124k steps → 124k steps 7) File register points: 1018k points → 128k points (Using memory card: 1018k points) 8) Extension stage: 7 stage → 7 stage (The QA extension base unit is connectable.) 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card
		Q06UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.075μs → 0.0095μs 3) PC MIX value: 3.8 → 60 4) I/O points: 4096 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 124k → 60k steps 7) File register points: 1018k points → 384k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card
		Q13UDHCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 0.15μs → 0.0095μs 3) PC MIX value: 1.8 → 60 4) I/O points: 2048 points → 4096 points 5) I/O device points: 8192 points → 8192 points 6) Program capacity: 124k → 130k steps 7) File register points: 1018k points → 512k points (Using memory card: 4086k points) 8) Extension stage: 7 stage → 7 stage 9) Number of memory cards: 2 cards → 1 card 10) Max. memory card SRAM capacity: 2M bytes × 2 cards → 8M bytes × 1 card

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A2CCPU A2CCPUP21*1 A2CCPUR21*1 A2CCPUC24-PRF A2CCPUC24 A2CJCPU-S3	Q02CPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.25μs → 0.079μs 3) PC MIX value: 0.1 → 4.4 4) I/O points: 512 points → 4096 points 5) I/O device points: 512 points → 4096 points 6) Program capacity: 8k → 28k steps 7) File register points: 4k points → 32k points (Using memory card: 1018k points) 8) Remote I/O: MINI-S3 → CC-Link 9) Applicable memory: built-in RAM/4KROM/8KROM/16ROM → Program memory/ Standard RAM/Standard ROM/memory card Q2MEM-** (Sold separately) 10) Micro computer program: Available → Not available
		Q00UCPU	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.25μs → 0.08μs 3) PC MIX value: 0.1 → 7.36 4) I/O points: 512 points → 1024 points 5) I/O device points: 512 points → 8192 points 6) Program capacity: 8k → 10k steps 7) File register points: 0k points → 64k points 8) Remote I/O: MINI-S3 → CC-Link 9) Applicable memory: built-in RAM /4KROM /8KROM /16ROM → Program memory / Standard RAM /Standard ROM 10) Micro computer program: Available → Not available

*1 The CPU module with the MELSECNET link function can be replaced with the QCPU module and the link module as listed in the following table.

Model	Alternative models		Precaution
	CPU model	**Network module model**	
A1NCPUP21 A2NCPUP21 A2NCPUP21-S1 A3NCPUP21 A2ACPUP21 A2ACPUP21-S1 A3ACPUP21 A2CCPUP21	Select a CPU module depending on the control targets of the A series CPU module.	QJ71LP21-25	Mounting the A/QnA series CPU module with the link function on a base unit → Mounting a link module on a base unit (1 slot is required and 32 points are occupied.)
A1NCPUR21 A2NCPUR21 A2NCPUR21-S1 A3NCPUR21 A2ACPUR21 A2ACPUR21-S1 A3ACPUR21 A2CCPUR21		QJ71BR11	Mounting the A/QnA series CPU module with the link function on a base unit → Mounting a link module on a base unit (1 slot is required and 32 points are occupied.) Coaxial loop → Coaxial bus
A1NCPUP21-S3 A2NCPUP21-S3 A2NCPUP21-S4 A3NCPUP21-S3 A2ACPUP21-S3 A2ACPUP21-S4 A3ACPUP21-S3		QJ71LP21G	Mounting the A/QnA series CPU module with the link function on a base unit → Mounting a link module on a base unit (1 slot is required and 32 points are occupied.)

2.2 CPU Module Specifications Comparisons

(1) Specifications comparisons between the A/QnA series CPU and the Universal model QCPU

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function	Contents	A/QnA series					
		A2CCPU	AnNCPU	AnACPU	AnUCPU	QnACPU	
Control method	Repetitive operation of stored program	○	○	○	○	○	
I/O control method	Refresh mode/Direct mode	○	○ *1	○ *2	○ *2	○ *2	
Programming language	Language dedicated to sequence control (Relay symbol, Logic symbol, MELSAP language)	○	○	○	○	○	
Processing speed	Sequence instruction (μs/step)	1.25	1.0	0.15	0.15	0.075	
Watchdog timer (WDT)	Watchdog timer (WDT) (ms)	10 to 2000	10 to 2000	200	200	10 to 2000	
Memory capacity	User memory capacity (bytes)	32k (Built-in RAM)	Max. 448k (Memory casette)	Max. 768k (Memory casette)	Max. 1024k (Memory casette)	Max. 2036k × 2 (SRAM card)	
	Sold separately	-	Memory casette	Memory casette	Memory casette	SRAM card	
Program capacity	Sequence program (steps)	Max. 8k	Max. 30k × 2	Max. 30k × 2	Max. 30k × 4	Max. 124k	
	Microcomputer program (bytes)	Max. 14k	Max. 58k	×	×	×	
Number of occupied I/O points	Number of I/O points (points) *5	512	256 to 2048	512 to 2048	512 to 4096	512 to 4096	

*1 Direct I/O is also selectable with the I/O control method setting switch.
*2 Basically, only the refresh mode is applicable, but some instructions/devices can be input/output in the direct mode.
*3 This is the capacity for the maximum number of steps in a sequence program.
*4 Only one memory card can be used.
*5 This is the number of applicable points for the access to the I/O modules actually connected.

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

	Universal model QCPU							Precaution for replacement	Reference section
	Q00UCPU	Q01UCPU	Q02UCPU	Q03UD CPU	Q04UDH CPU	Q06UDH CPU	Q13UDH CPU		
	○	○	○	○	○	○	○	-	-
	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	Use direct I/O instructions to input/output in the direct mode, as the Q series supports the refresh mode only.	Section 7.7.2
	○	○	○	○	○	○	○	The MELSAP language for QnA/Q series is MELSAP3 and that for A series is MELSAP- II.	Section 7.6
	0.08	0.06	0.04	0.02	0.0095	0.0095	0.0095	-	-
	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	-	-
	(Setting available in 10ms unit.)							-	-
	• Program memory *3 :40K • Standard RAM :128K • Standard ROM :512K	• Program memory *3 :60K • Standard RAM :128K • Standard ROM :512K	• Program memory *3 :80K • Standard RAM :64K • Standard ROM :512K	• Program memory *3: 120K • Standard RAM:192K • Standard ROM: 1024K	• Program memory *3: 160K • Standard RAM:256K • Standard ROM: 1024K	• Program memory *3: 240K • Standard RAM:768K • Standard ROM: 1024K	• Program memory *3: 520K • Standard RAM: 1024K • Standard ROM: 2048K	A memory cassette is required for the A series as user memory, while the user memory is included in the Q series as standard equipment.	Section 2.4.1
	×	×	Memory card *4 RAM: Max. 8M Flash: Max. 4M ATA: Max. 32M	Memory card *4 RAM: Max. 8M Flash: Max. 4M ATA: Max. 32M	Memory card *4 RAM: Max. 8M Flash: Max. 4M ATA: Max. 32M	Memory card *4 RAM: Max. 8M Flash: Max. 4M ATA: Max. 32M	Memory card *4 RAM: Max. 8M Flash: Max. 4M ATA: Max. 32M	-	-
	Max. 10k	Max. 15k	Max. 20k	Max. 30k	Max. 40k	Max. 60k	Max. 130k	-	-
	×	×	×	×	×	×	×	The AnA, AnU, QnA and Q series do not include microcomputer program. Therefore, consider use of sequence program, etc as the substitution.	-
	1024	1024	2048	4096	4096	4096	4096	-	-

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function	Contents		A/QnA series					
			A2CCPU	AnNCPU	AnACPU	AnUCPU	QnACPU	
No. of device points	Input device (X) (points) *1		512	256 to 2048	512 to 2048	8192	8192	
	Output device (Y) (points) *1		512	256 to 2048	512 to 2048	8192	8192	
	Internal relay (M) (points)		Total 2048	Total 2048	Total 8192	Total 8192	8192	
	Latch relay (L) (points)						8192	
	Step relay (S) (points)						8192 *2	
	Annunciator (F) (points)		256	256	2048	2048	2048	
	Edge relay (V) (points)		×	×	×	×	2048	
	Link relay (B) (points)		1024	1024	4096	8192	8192	
	Timer (T) (points)		256	256	2048	2048	2048	
	Counter (C) (points)		256	256	1024	1024	1024	
	Data register (D) (points)		1024	1024	6144	8192	12288	
	Link register (W) (points)		1024	1024	4096	8192	8192	
	File register (R)	R (points)	4096	8192	8192	8192	32768	
		ZR (points)	×	×	×	×	Max. 1018k	
	Accumulator (A) (points)		2	2	2	2	×	
	Index register	(Z) (points)	1	1	7	7	16	
		(V) (points)	1	1	7	7	×	
	Nesting (N) (points)		8	8	8	8	15	
	Pointer (P) (points)		256	256	256	256	4096	
	Interrupt pointer (I) (points)		×	32	32	32	48	
	Special relay (M/SM) (points)		256	256	256	256	2048	
	Special register (D/SD) (points)		256	256	256	256	2048	
	Link special relay (SB) (points)		×	×	×	×	2048	
	Link special register (SW) (points)		×	×	×	×	2048	
	Function input (FX) (points)		×	×	×	×	16	
	Function output (FY) (points)		×	×	×	×	16	
	Function register (FD) (points)		×	×	×	×	5	
Comment points	Comment points (points) *3		Max. 1600	Max. 4032	Max. 4032	Max. 4032	Max. approx. 50k	
	Extended comment		Max. 3968	Max. 3968	Max. 3968	Max. 3968	×	
Self-diagnostics	Watchdog timer (WDT), Memory error detection, CPU error detection, Battery error detection		○	○	○	○	○	
Operation mode at error occurrence	Stop/Continue setting		○	○	○	○	○	
Output mode switching at changing from STOP to RUN	Re-output operation status before STOP/Selection of output after operation execution		○	○	○	○	○	

*1 This number means the number of useable points on the program.

*2 The points are when the capacity of a memory card to be used is 2M bytes.

*3 This is the number of points that can be written to CPU.

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

	Universal model QCPU							Precaution for replacement	Reference section
	Q00UCPU	Q01UCPU	Q02UCPU	Q03UD CPU	Q04UDH CPU	Q06UDH CPU	Q13UDH CPU		
	8192	8192	8192	8192	8192	8192	8192	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	8192 *2	8192 *2	8192 *2	8192 *2	8192 *2	8192 *2	8192 *2	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	1024	1024	1024	1024	1024	1024	1024	-	
	12288	12288	12288	12288	12288	12288	12288	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	32768	32768	32768	32768	32768	32768	32768	-	
	65536	65536	65536 (when a memory card is used: + Max. 4086K)	98304 (when a memory card is used: + Max. 4086K)	131072 (when a memory card is used: + Max. 4086K)	393216 (when a memory card is used: + Max. 4086K)	524288 (when a memory card is used: + Max. 4086K)	-	
	×	×	×	×	×	×	×	Accumulators are converted to the special registers (SD718, SD719) upon A → Q program conversion as they are not included in the QnA and Q series.	Section 7.7.8
	20	20	20	20	20	20	20	-	
	×	×	×	×	×	×	×	This is used as edge relay for the QnA and Q series.	
	15	15	15	15	15	15	15	-	
	512	512	4096	4096	4096	4096	4096	-	
	128	128	256	256	256	256	256	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	2048	2048	2048	2048	2048	2048	2048	-	
	16	16	16	16	16	16	16	-	
	16	16	16	16	16	16	16	-	
	5	5	5	5	5	5	5	-	
	Within the total memory capacity of Program memory + Standard RAM + Standard ROM							-	
	×	×	×	×	×	×	×	-	
	○	○	○	○	○	○	○	-	
	○	○	○	○	○	○	○	-	
	○	○	○	○	○	○	○	-	

(2) Specifications comparisons between the A/QnA series CPU and the High Performance model QCPU

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function	Contents		A/QnA series					
			A2CCPU	AnNCPU	AnACPU	AnUCPU	QnACPU	
Control method	Repetitive operation of stored program		○	○	○	○	○	
I/O control method	Refresh mode/Direct mode		○	○ *1	○ *2	○ *2	○ *2	
Programming language	Language dedicated to sequence control (Relay symbol, Logic symbol, MELSAP language)		○	○	○	○	○	
Processing speed	Sequence instruction (μs/step)		1.25	1.0	0.15	0.15	0.075	
Watchdog timer (WDT)	Watchdog timer (WDT) (ms)		10 to 2000	10 to 2000	200	200	10 to 2000	
Memory capacity	User memory capacity (bytes)		32k (Built-in RAM)	Max. 448k (Memory casette)	Max. 768k (Memory casette)	Max. 1024k (Memory casette)	Max. 2036k × 2 (SRAM card)	
		Sold separately	-	Memory casette	Memory casette	Memory casette	SRAM card	
Program capacity	Sequence program (steps)		Max. 8k	Max. 30k × 2	Max. 30k × 2	Max. 30k × 4	Max. 124k	
	Microcomputer program (bytes)		Max. 14k	Max. 58k	×	×	×	
Number of occupied I/O points	Number of I/O points (points) *5		512	256 to 2048	512 to 2048	512 to 4096	512 to 4096	

*1 Direct I/O is also selectable with the I/O control method setting switch.
*2 Basically, only the refresh mode is applicable, but some instructions/devices can be input/output in the direct mode.
*3 This is the capacity for the maximum number of steps in a sequence program.
*4 Only one memory card can be used.
*5 This is the number of applicable points for the access to the I/O modules actually connected.

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

	Basic model QCPU			High Performance model QCPU				Precaution for replacement	Reference section
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU		
	○	○	○	○	○	○	○	-	-
	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	Use direct I/O instructions to input/output in the direct mode, as the Q series supports the refresh mode only.	Section 7.7.2
	○	○	○	○	○	○	○	The MELSAP language for QnA/Q series is MELSAP3 and that for A series is MELSAP- II.	Section 7.6
	0.2	0.16	0.1	0.079	0.0034	0.0034	0.0034	-	-
	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	10 to 2000	-	-
	(Setting available in 10ms unit.)							-	-
	• Program memory (RAM) *3 :58K • Standard ROM :58K	• Program memory (RAM) *3 :94K • Standard RAM :128K • Standard ROM :94K	• Program memory (RAM) *3 :94K • Standard RAM :128K • Standard ROM :94K	• Program memory (RAM) *3 :112K • Standard RAM :64K • Standard ROM :112K	• Program memory (RAM) *3 :112K • Standard RAM :128K • Standard ROM :112K	• Program memory (RAM) *3 :240K • Standard RAM :128K • Standard ROM :240K	• Program memory (RAM) *3 :496K • Standard RAM :256K • Standard ROM :496K	A memory cassette is required for the A series as user memory, while the user memory is included in the Q series as standard equipment.	Section 2.4.1
	×	×	×	Memory card *4 • RAM: Max. 8M • Flash: Max. 4M • ATA: Max. 32M	Memory card *4 • RAM: Max. 8M • Flash: Max. 4M • ATA: Max. 32M	Memory card *4 • RAM: Max. 8M • Flash: Max. 4M • ATA: Max. 32M	Memory card *4 • RAM: Max. 8M • Flash: Max. 4M • ATA: Max. 32M	-	-
	Max. 8K	Max. 8K	Max. 14K	Max. 28K	Max. 28K	Max. 60K	Max. 124K	-	-
	×	×	×	×	×	×	×	The AnA, AnU, QnA and Q series do not include microcomputer program. Therefore, consider use of sequence program, etc as the substitution.	-
	256	1024	1024	4096	4096	4096	4096	-	-

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function	Contents		A/QnA series					
			A2CCPU	AnNCPU	AnACPU	AnUCPU	QnACPU	
No. of device points	Input device (X) (points) *1		512	256 to 2048	512 to 2048	8192	8192	
	Output device (Y) (points) *1		512	256 to 2048	512 to 2048	8192	8192	
	Internal relay (M) (points)		Total 2048	Total 2048	Total 8192	Total 8192	8192	
	Latch relay (L) (points)						8192	
	Step relay (S) (points)						8192 *2	
	Annunciator (F) (points)		256	256	2048	2048	2048	
	Edge relay (V) (points)		×	×	×	×	2048	
	Link relay (B) (points)		1024	1024	4096	8192	8192	
	Timer (T) (points)		256	256	2048	2048	2048	
	Counter (C) (points)		256	256	1024	1024	1024	
	Data register (D) (points)		1024	1024	6144	8192	12288	
	Link register (W) (points)		1024	1024	4096	8192	8192	
	File register (R)	R (points)	4096	8192	8192	8192	32768	
		ZR (points)	×	×	×	×	Max. 1018k	
	Accumulator (A) (points)		2	2	2	2	×	
	Index register	(Z) (points)	1	1	7	7	16	
		(V) (points)	1	1	7	7	×	
	Nesting (N) (points)		8	8	8	8	15	
	Pointer (P) (points)		256	256	256	256	4096	
	Interrupt pointer (I) (points)		×	32	32	32	48	
	Special relay (M/SM) (points)		256	256	256	256	2048	
	Special register (D/SD) (points)		256	256	256	256	2048	
	Link special relay (SB) (points)		×	×	×	×	2048	
	Link special register (SW) (points)		×	×	×	×	2048	
	Function input (FX) (points)		×	×	×	×	16	
	Function output (FY) (points)		×	×	×	×	16	
	Function register (FD) (points)		×	×	×	×	5	
Comment points	Comment points (points) *3		Max. 1600	Max. 4032	Max. 4032	Max. 4032	Max. approx. 50k	
	Extended comment		Max. 3968	Max. 3968	Max. 3968	Max. 3968	×	
Self-diagnostics	Watchdog timer (WDT), Memory error detection, CPU error detection, Battery error detection		○	○	○	○	○	
Operation mode at error occurrence	Stop/Continue setting		○	○	○	○	○	
Output mode switching at changing from STOP to RUN	Re-output operation status before STOP/Selection of output after operation execution		○	○	○	○	○	

*1 This number means the number of useable points on the program.

*2 The points are when the capacity of a memory card to be used is 2M bytes.

*3 This is the number of points that can be written to CPU.

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

	Basic model QCPU			High Performance model QCPU				Precaution for replacement	Reference section
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU		
	2048	2048	2048	8192	8192	8192	8192	-	
	2048	2048	2048	8192	8192	8192	8192	-	
	8192	8192	8192	8192	8192	8192	8192	-	
	2048	2048	2048	8192	8192	8192	8192	-	
	2048 *2	2048 *2	2048 *2	8192 *2	8192 *2	8192 *2	8192 *2	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	2048	2048	2048	8192	8192	8192	8192	-	
	512	512	512	2048	2048	2048	2048	-	
	512	512	512	1024	1024	1024	1024	-	
	11136	11136	11136	12288	12288	12288	12288	-	
	2048	2048	2048	8192	8192	8192	8192	-	
	×	32768	32768	32768	32768	32768	32768	-	
	×	65536	65536	32768 (when a memory card is used: + Max. 1018K)	65536 (when a memory card is used: + Max. 1018K)	65536 (when a memory card is used: + Max. 1018K)	131072 (when a memory card is used: + Max. 1018K)	-	
	×	×	×	×	×	×	×	Accumulators are converted to the special registers (SD718, SD719) upon A → Q program conversion as they are not included in the QnA and Q series.	Section 7.7.8
	10	10	10	16	16	16	16	-	
	×	×	×	×	×	×	×	This is used as edge relay for the QnA and Q series.	
	15	15	15	15	15	15	15	-	
	300	300	300	4096	4096	4096	4096	-	
	128	128	128	256	256	256	256	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	1024	1024	1024	2048	2048	2048	2048	-	
	16	16	16	16	16	16	16	-	
	16	16	16	16	16	16	16	-	
	5	5	5	5	5	5	5	-	
	Within the free area of the program memory	Within the range of the standard RAM	Within the range of the standard RAM	Max. approx. 50k	Max. approx. 50k	Max. approx. 50k	Max. approx. 50k	-	
	×	×	×	×	×	×	×	-	
	○	○	○	○	○	○	○	-	
	○	○	○	○	○	○	○	-	
	○	○	○	○	○	○	○	-	

2.3 CPU Module Functional Comparisons

2.3.1 Functional comparisons between A2CCPU, AnNCPU and Q series CPU

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	A series		Q series		Precaution for replacement	Reference section
			A2CCPU	AnNCPU	Universal model QCPU *1	High Performance model *2		
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	△	△	Set this function with the special register (D9020) for A series, and with parameters for Q series.	–
	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than the allowable momentary power failure period.	○	○	○	○	–	–
	Remote RUN/ STOP	Executes the remote RUN/ STOP using external switches and peripheral devices.	○	○	○	○	–	–
	PAUSE	Stops operations while holding the output status.	○	○	△	△	Set the PAUSE enable flag with the special relay (M9040) for A series, and with the special relay (SM206) for Q series.*3	Section 7.4.1
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	△	△	For A series, an interrupt program is required for each main program and sub-program separately. For Q series, create only one interrupt program to share between the two programs.	Section 7.7.10
	Microcomputer mode	Executes various controls and operations over utility programs and user created microcomputer programs stored in the microcomputer program area by calling them from the sequence program.	○	○	×	×	Consider use of sequence program, etc., as the substitution. The Q series does not include the instructions by a utility package. Therefore, modify the corresponding instructions of QCPU and substitute them.	–
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	×	○	○	Target errors vary by model, but there is no functional difference.	–
	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	○	△	△	To execute the ROM operation with the High Performance model CPU, read a sequence program stored in the standard ROM or a memory card to the program memory using the boot run function. With the Universal model QCPU, the ROM operation is not required since the program memory is the flash ROM.	Section 7.7.12

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High Performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

*3 Device numbers are converted upon the programmable controller type change by GX Developer. (Refer to Section 7.4)

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	A series		Q series		Precaution for replacement	Reference section
			A2CCPU	AnNCPU	Universal model QCPU *1	High Performance model *2		
Control	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing to programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	△	△	The Q series prohibits each file from being read/written by password registration, whereas the A series prohibits the parameters and programs from being read/ written to the user memory by keyword registration.	Section 2.4.2
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between “re-output operation status before STOP” and “output after operation execution”.	○	○	○	○	In case of transition from the A series, it is necessary to re-set the parameters.	–
	Clock function	A CPU includes a clock, of which data can be read and written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○*4	○	△	△	The Q series handles the four digits of the year (western calendar), whereas the A series handles only the last two digits.	–
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○	○	○*5	○*5	For the Q series, it is necessary to set the reserved capacity for the write during RUN in advance.	Section 2.4.3
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○	○*6	×	×	The Q series does not include the status latch function.	–
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○	○*6	○*7	○	–	–
	Step operation	Stops the execution of a sequence program at the specified step.	×	○	×	×	The Q series does not include the step operation function. Consider the debug with GX Simulator.	–
	Off-line switch	Skips the devices used for OUT instruction in the operation processing of sequence program.	○	○	×	×	The Q series does not include the off-line switch function. Consider using the forced on/off function for external I/O.	–
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	×	○	×	×	Replace I/O module while CPU is in RUN. (Only supported for Process CPU)	–
	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	○	○	Error codes differ between the A series and Q series.	–

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High Performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

*4 Only A2CCPUC24 (-PRF) is applicable. A2CJCPU-S3 and A2CCPU (P21/R21) are not.

*5 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

*6 The A1NCPU (P21/R21) is not applicable.

*7 The Q00UJCPU does not support the sampling trace function.

2.3.2 Functional comparisons between AnACPU, AnUCPU and Q series CPU

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	A series		Q series		Precaution for replacement	Reference section
			AnACPU	AnUCPU	Universal model QCPU *1	High Performance model *2		
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	△	△	Set this function with the special register (D9020) for A series, and with parameters for Q series.	–
	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than the allowable momentary power failure period.	○	○	○	○	–	–
	Remote RUN/ STOP	Executes the remote RUN/ STOP using external switches and peripheral devices.	○	○	○	○	–	–
	PAUSE	Stops operations while holding the output status.	○	○	△	△	Set the PAUSE enable flag with the special relay (M9040) for A series, and with the special relay (SM206) for Q series.*3	Section 7.4.1
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	△	△	For A series, an interrupt program is required for each main program and sub-program separately. For Q series, create only one interrupt program to share between the two programs.	Section 7.7.10
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	○	○	Target errors vary by model, but there is no functional difference.	–
	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	○	△	△	To execute the ROM operation with the High Performance model CPU, read a sequence program stored in the standard ROM or a memory card to the program memory using the boot run function. With the Universal model QCPU, the ROM operation is not required since the program memory is the flash ROM.	Section 7.7.12
	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing to programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	△	△	The Q series prohibits each file from being read/written by password registration, whereas the A series prohibits the parameters and programs from being read/ written to the user memory by keyword registration.	Section 2.4.2
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between “re-output operation status before STOP” and “output after operation execution”.	○	○	○	○	In case of transition from the A series, it is necessary to re-set the parameters.	–
	Clock function	A CPU includes a clock, of which data can be read/written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○	○	△	△	The Q series handles the four digits of the year (western calendar), whereas the A series handles only the last two digits.	–

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High Performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

*3 Device numbers are converted upon the programmable controller type change by GX Developer. (Refer to Section 7.4)

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	A series		Q series		Precaution for replacement	Reference section
			AnACPU	AnUCPU	Universal model QCPU *1	High Performance model *2		
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○	○	○*4	○*4	For the Q series, it is necessary to set the reserved capacity for the write during RUN in advance.	Section 2.4.3
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○	○	×	×	The Q series does not include the status latch function.	–
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○	○	○*5	○	–	–
	Step operation	Stops the execution of a sequence program at the specified step.	○	○	×	×	The Q series does not include the step operation function. Consider the debug with GX Simulator.	–
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	○	○	×	○	Replace I/O module while CPU is in RUN. (Only supported for Process CPU)	–
	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	○	○	Error codes differ between the A series and Q series.	–
	Error history	Stores errors detected by the diagnostics function into the CPU. Error details can be monitored from peripheral devices.	○	○	○	○	The Q series can store error history data in a memory card (up to 100 errors) as well as in the built-in memory.	–

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High Performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

*4 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

*5 The Q00UJCPU does not support the sampling trace function.

2.3.3 Functional comparisons between QnACPU and Q series CPU

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	QnA series	Q series		Precaution for replacement	Reference section
			QnACPU	Universal model QCPU *1	High Performance model *2		
Control	Constant scan	Executes the sequence program at the constant time intervals regardless of the processing time of the program.	○	○	○	–	–
	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than the allowable momentary power failure period.	○	○	○	–	–
	Remote RUN/ STOP	Executes the remote RUN/STOP using external switches and peripheral devices.	○	○	○	–	–
	PAUSE	Stops operations while holding the output status.	○	○	○	–	–
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	○	–	–
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	○	Target errors vary by model, but there is no functional difference.	–
	File management	Manages all of parameters, sequence programs, device comments, file registers, etc as files.	○	○	○	Memory configuration and data to be stored differ between the QnA series and Q series.	Section 2.4.1
	Structured program	Selects a suitable execution type for program application, and divides each program by designer, process or others.	○	○	○	–	–
	I/O assignment	Performs the I/O assignment to any individual module regardless of its mounted position.	○	△	△	When using a base unit with other than 8 slots, set the number of slots with the parameter (I/O assignment setting).	Section 2.4.4
	Boot run (ROM operation)	Executes the sequence program after reading it from the memory card to the CPU built-in memory when the CPU goes to RUN mode.	○	△	△	To execute the ROM operation with the High Performance model CPU, read a sequence program stored in the standard ROM or a memory card to the program memory using the boot run function. With the Universal model QCPU, the ROM operation is not required since the program memory is the flash ROM.	Section 2.4.1
	Data protection (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices to read/ write the programs and comments in the CPU built-in memory, memory cassette, or memory card.	○	△	△	The Q series provides read/write protection for each file with password registration. The QnA series prohibits parameters/ programs read/write from/to the user memory with keyword registration.	Section 2.4.2
	Initial device value	Sets an initial value of device memory, file registers, and special function modules, etc. when the CPU has become RUN status.	○	○	○	Memory configuration and data to be stored differ between the QnA series and Q series.	Section 2.4.1
	Output status setting at changing from STOP to RUN	Sets the output (Y) status at the change from STOP to RUN to re-outputting data before STOP or outputting data after the operation execution.	○	○	○	Resetting parameters is required to replace the QnA series with the Q series.	–

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

○: Usable △: Partially different in spec. (eg. setting method) ×: Unusable

Function		Contents	QnA series	Q series		Precaution for replacement	Reference section
			QnACPU	Universal model QCPU *1	High Performance model *2		
Control	Number of general data processing	Sets the number of general data processing executed in one END operation.	○	△	△	For the Q series use COM instructions or set the communication reserved time with special register (SD315) if necessary.	–
	Clock function	A CPU incorporates a clock, which can be read/written. The clock data consists of year, month, day, hour, minute, second and a day of the week.	○	△	△	The Q series uses 4-digit year of the western calendar while the QnA series uses the lower 2-digit year.	–
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○*3	○*3	○*3	For the Q series, it is necessary to set the reserved capacity for the write during RUN in advance.	Section 2.4.3
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○*5	×	×	The Q series does not include the status latch function.	–
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○*4	○*4	○*4	–	–
	Program trace	Collects the execution status of specified programs and steps, and stores them in a file.	○*4 *5	×	×	The Q series does not incorporate the program trace function.	–
	Simulation function	Detaches I/O modules or special modules from the CPU module and test-operates the program upon the step operation.	○*5	×	×	The Q series does not have the simulation function. Performing debugging with GX Simulator is recommended.	–
	Step operation	Stops the execution of a sequence program at the specified step.	○	×	×	The Q series does not include the step operation function. Consider the debug with GX Simulator.	–
	Execution time measurement (Program list monitor, scan time measurement)	Measures the operation time for each program.	○	○	○	–	–
	Module access interval reading	Monitors the access interval of special function modules or peripheral devices.	○	○	○	*6	–
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	○	×	○	Replace I/O module while CPU is in RUN. (Only supported for Process CPU)	–
	Self-diagnostics	Diagnoses whether any error has occurred, detects errors and stop a CPU, etc.	○	○	○	Error codes differ between the A series and Q series.	–
	Error history	Stores errors, which are detected with the diagnostics function, in a CPU or memory card. The stored history can be monitored with peripheral devices.	○	○	○	–	–

*1 Universal model QCPU is the generic term for the QnUCPUs such as the Q00UJCPU, Q00UCPU, and Q01UCPU.

*2 "High performance model" is the generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU.

*3 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

*4 The Q00UJCPU does not support the sampling trace function.

*5 SW ☐ IVD-GPPQ is required. This is not applicable to GX Developer.

*6 For the Q series, access interval is called as "module service interval".

2.4 Precautions for CPU Module Replacement

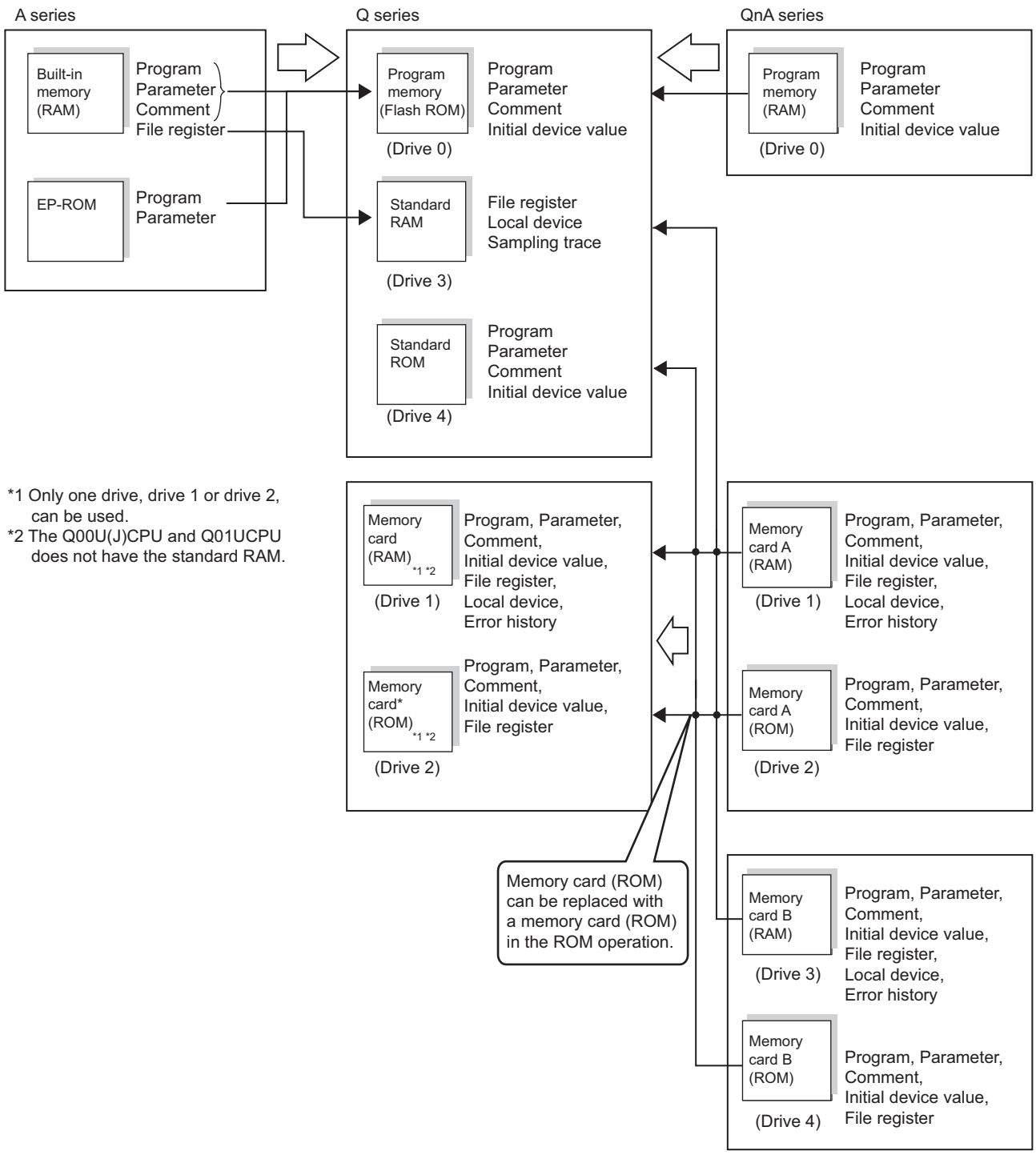
2.4.1 Memory for CPU module

The memory configuration is shown in (1). Examine the following points depending on the memory capacity before replacement and applications.

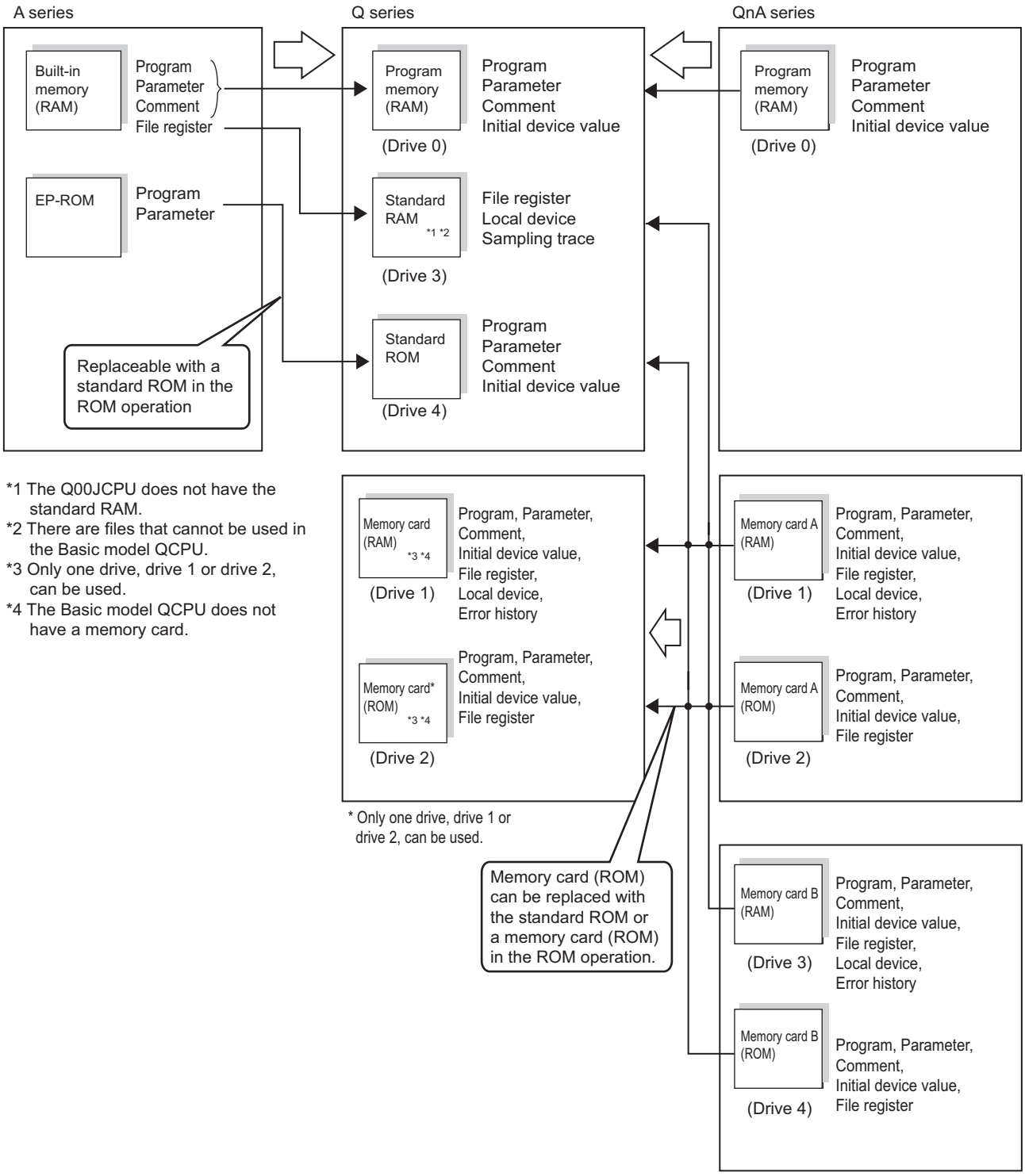
- Memory to store
- To use or not use a memory card

(1) Memory configuration and data that can be stored

(a) Universal model QCPU



(b) High performance model QCPU



*1 The Q00JCPU does not have the standard RAM.
*2 There are files that cannot be used in the Basic model QCPU.
*3 Only one drive, drive 1 or drive 2, can be used.
*4 The Basic model QCPU does not have a memory card.

(2) Capacity of each memory

The following table shows the memory of CPU modules, in which the user program, etc. is stored, together with its capacity.

Item		Model			
		A series	QnA series	Q series	
				Universal model QCPU	High Performance model
Memory cassette		Max. 1024k bytes	–	–	
Built-in RAM		Max. 32k bytes (for A2CCPU only)	Max. 496k bytes (Program memory)	Max. 4000k bytes (Program memory)	Max. 1008k bytes (Program memory)
Memory card*1	SRAM card	–	Max. 2M bytes	Max. 8M bytes	Max. 2M bytes
	EEPROM card	–	Max. 512k bytes	–	
	Flash card	–	Max. 1M bytes	Max. 4M bytes	
	ATA card	–	–	Max. 32M bytes	
Standard RAM		–	–	Max. 1792k bytes (Q00UJCPU: None)	Max. 256k bytes
Standard ROM		–	–	Max. 16384k bytes	Max. 1008k bytes

*1 Two memory cards can be installed in total for large-sized QnA series and either one of the memory cards can be installed for Q series.

2.4.2 Keyword registration and password registration

The Q series prohibits reading from/writing to programs, etc. when a password is registered, as does the A/QnA series with keyword registration. Available functions are described below.

Item	Model		
	A series	QnA series	Q series
Prohibiting method for writing to program, etc.	The following attribute can be set to the specified memory. • Prohibition of read/write	Either of the following attributes can be set to the specified memory (drive). • Prohibition of read/write display • Prohibition of write	Batch password setting for all files provides the equivalent function. (Supplement) By using a password, the following attributes can be set to each specified file of the specified memory (drive). • Prohibition of read/write display • Prohibition of write

2.4.3 Write during RUN

To execute the write during RUN, it is necessary to, reserve the program capacity for increase upon the write during RUN in advance.

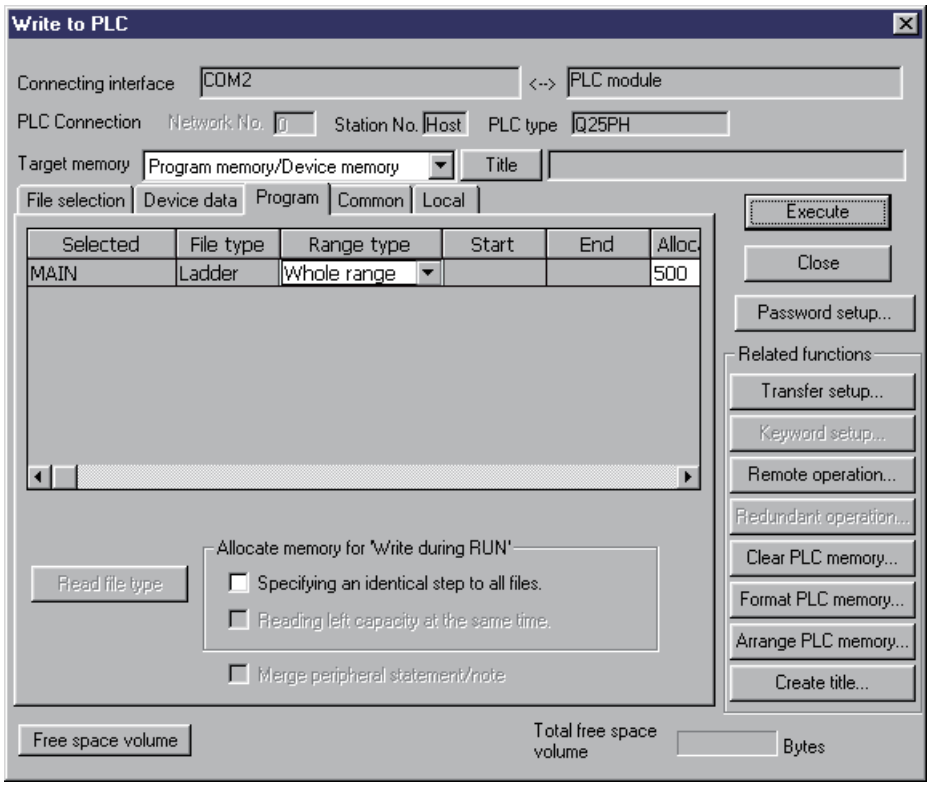
(1) A series

The program capacity is decided by the parameter (memory capacity setting), and can be increased within the capacity range upon write during RUN.

(2) QnA/Q series

It is necessary to set the program capacity for increase upon the write during RUN at Write to PLC. (This set capacity is called as the write during RUN reserved step. By default, 500 steps are reserved.)

The following shows the setting screen for Allocate memory for Write during RUN as a reference.



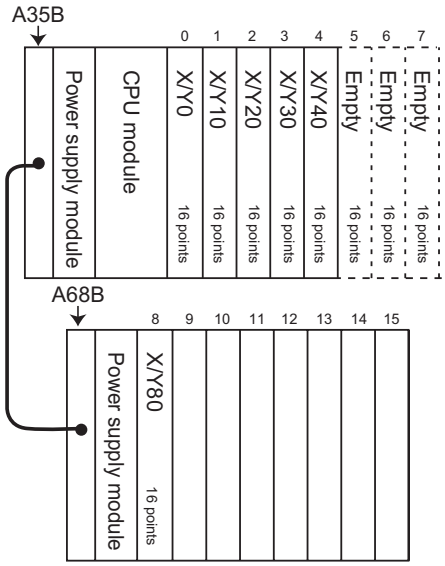
2.4.4 No. of base unit I/O slots

The following table indicates how the No. of base unit I/O slots is allocated for each series.

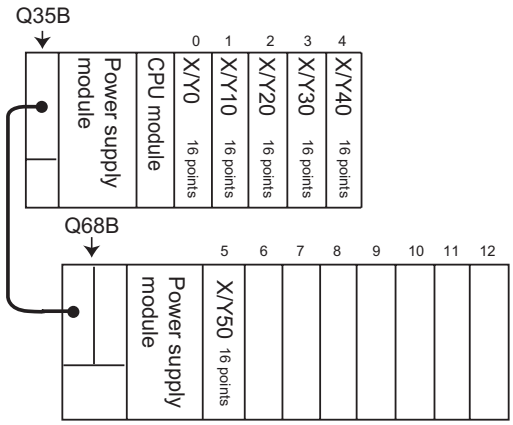
Item	Model		
	A series	QnA series	Q series
No. of base unit I/O slots	Fixed to 8 slots regardless of the actual number.		To use a base unit other than 8 slots, set the number of slots. (Supplement) Default follows the actual slot number. (Setting changeable with parameter)

The following gives an example of replacing the A35B+A68B system (Default parameter is used) with the Q35B+Q68B system.

(A series I/O assignment before replacement)

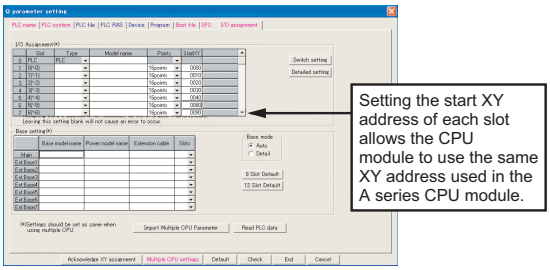


(Q series I/O assignment after replacing modules)

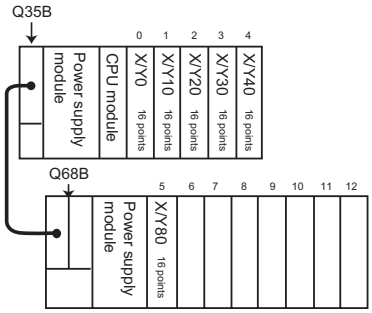


When replacing modules,
the first I/O number of
the first extension stage becomes [X/Y50].

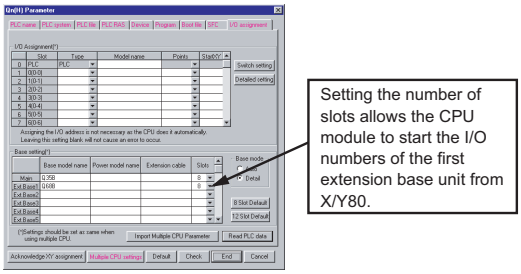
(1) Setting the start XY address of each slot



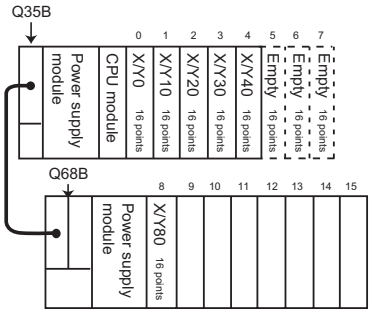
(I/O assignment for the Q series when the start XY address of each slot is set after replacement)



(2) Setting the number of slots to "8"



(I/O assignment for the Q series when the number of slots of the base unit is set after replacement)



2.4.5 Programming tool and connection cable for Q series CPU

(1) Programming tool for Q series CPU

The programming for the Q series CPU is performed with GX Developer.
Note that the following programming software packages are not applicable.

Compatible CPU	Software package model
ACPU	SW□SRXV-GPPA
	SW□IVD-GPPA
QnACPU	SW□IVD-GPPQ

(2) Connection cable for Q series CPU

When connecting a personal computer in which GX Developer has been installed to the Q series CPU, RS-232 connection and USB connection are available.
The availability depending on CPU model is shown in the following table.
Note that the RS232/RS422 conversion cable for the A/QnA series CPU are not applicable.

(a) Universal model QCPU

CPU model	RS-232 connection	USB connection
Q00UJCPU Q00UCPU Q01UCPU Q02UCPU Q03UDCPU	Available*1	Available*2 (USB type A to USB type miniB)
Q04UDHCPU		
Q06UDHCPU		
Q10UDHCPU		
Q13UDHCPU		

*1 Applicable cable is the QC30R2.
*2 The following cables are used to check the operation.
KU-AMB530 (manufactured by SANWA SUPPLY INC.)
USB-M53 (manufactured by ELECOM CO., LTD)
MR-J3USBCBL3M (manufactured by Mitsubishi Electric Corporation)
GT09-C30USB-5P (manufactured by Mitsubishi Electric System & Service Co., Ltd.)

(b) Basic model QCPU, High Performance model QCPU

CPU model	RS-232 connection	USB connection
Q00JCPU Q00CPU Q01CPU Q02CPU	Available*1	Unavailable
Q02HCPU Q06HCPU Q12HCPU Q12PHCPU Q25HCPU Q25PHCPU		Available*2 (USB type A to USB type B)

*1 Applicable cable is the QC30R2.
*2 The following cables are used to check the operation.
USB2-30 (manufactured by ELECOM CO., LTD)
AU2-30 (manufactured by BUFFALO KOKUYO SUPPLY INC.)

Refer to GX Developer Operating Manual for details.

3 REPLACING I/O MODULES

3.1 List of Alternative I/O Module Models

3.1.1 List of alternative Q series standard type module models

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX10	QX10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX11	QX10*1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32=16 × 2) 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX11EU	QX10	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32=16 × 2) 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX20	QX28	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of input points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX21	QX28*1	1) Change in external wiring: Required 2) Change in the number of slots: Required (4 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (32 points → 64 points (16 points × 4 modules)) Change in the number of input points: 32 points × 1 module → 8 points × 4 modules 4) Change in specifications Change in rated input voltage: Required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX21EU	QX28	1) Change in external wiring: Required 2) Change in the number of slots: Required (4 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (32 points → 64 points (16 points × 4 modules)) Change in the number of input points: 32 points × 1 module → 8 points × 4 modules 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
Input module	AX31	None	Alternating with QX41 is recommended. [When applying DC input] 1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) * Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required *: When 12VDC is required, use QX71. [When applying AC input] Convert the 12/24VAC to DC externally before inputting to QX41.
	AX31-S1	QX41	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX40	QX40 (when using 24VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX70 (when using 12VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX40-UL	QX40 (when using 24VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX70 (when using 12VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX41	QX41 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX41-S2 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX71 (when using 12VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX41-S1	QX41-S1	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
Input module	AX41-UL	QX41 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX41-S2 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX71 (when using 12VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX42	QX42 (when using 24VDC)	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 7mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX41-S2 (when using 24VDC)	1) Change in external wiring: Not required 2) Change in the number of slots: Required (2 modules are required.) 3) Change in a program Change in the number of occupied I/O points: Not required (64 points → 32 points × 2 modules) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 7mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX72 (when using 12VDC)	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Not required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Not required 5) Change in functions : Not required
	AX42-S1	QX42-S1	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX50 (S1)	QX50	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage : Not required Change in rated input current : Not required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Not required Change in input resistance : Required (Approx. 11kΩ → Approx. 11.2kΩ) 5) Change in functions : AC input possible
	AX60-S1	None	Alternating with QX40 is recommended.
	AX70	QX70	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX71	QX71	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX80	QX80 (when using 24VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX70 (when using 12VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX80E	QX82-S1 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required (Parameters must be set.) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX70 (when using 12VDC)	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
Input module	AX81	QX81 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
		QX81-S2 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 10mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
		QX71 (when using 12VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
	AX81B	None	Alternating with QX81 is recommended. 1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : The wire breakage detection function not provided

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX81-S1	QX81 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 5mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX81-S2 (when using 24VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 5mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX71 (when using 12VDC)	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX81-S2	None	Alternating with QX81 is recommended. 1) Change in external wiring: Required (Connector terminal block must be converted.) Connect a 5.6kΩ (1/2W or more) or 8.2kΩ (1W or more) resistor serially to the external signal wire at 48VDC or 60VDC, respectively. 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX81-S3	QX82-S1	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Required (32 points → 64 points) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AX82	QX82 (when using 24VDC)	1) Change in external wiring: Required (D-sub FCN connector) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 7mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX81-S2 (when using 24VDC)	1) Change in external wiring: Not required 2) Change in the number of slots: Required (2 modules are required.) 3) Change in a program Change in the number of occupied I/O points: Not required (64 points → 32 points × 2 modules) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required (Approx. 7mA → Approx. 6mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
		QX72 (when using 12VDC)	1) Change in external wiring: Required (D-sub FCN connector) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Required (24VDC not applicable) Change in rated input current: Required (Approx. 7mA → Approx. 4mA) Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY10	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Not required
	AY10A	QY18A *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Not required
	AY11	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No varistor, relay not replaceable)
	AY11A	QY18A *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No varistor)

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY11AEU	QY18A	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No varistor)
	AY11E	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No fuse, no varistor)
	AY11EEU	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No fuse, no varistor)
	AY11-UL	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No varistor)
	AY13	QY10 *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32 = 16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Not required

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY13E	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32 = 16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Required (No fuse)
	AY13EU	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32=16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions : Not required
	AY15EU	QY10	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required (However, contact life span is reduced to half.) 5) Change in functions: Not required
	AY22	QY22	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Required (from 2A to 0.6A) 5) Change in functions : Required (No fuse, no varistor)
	AY23	QY22 *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32 points = 16 points × 2 modules) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (No fuse)

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY40	QY40P	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Protection function equipped)
	AY40P		1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
	AY40A	QY68A	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required Response: Slow 5) Change in functions : Not required
	AY41	QY41P	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Required 5) Change in functions : Required (Protection function equipped)
	AY41P		1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY41-UL	QY41P	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Protection function equipped)
	AY42	QY42P	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Protection function equipped)
	AY42-S1	QY42P	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required Response time: Required (from 0.3ms to 1ms or less) 5) Change in functions: Required (Protection function equipped)
	AY42-S3	QY42P	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (The short protection function is equivalent to a fuse)
	AY42-S4	QY42P	1) Change in external wiring: Required (External power supply is required) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Protection function equipped)

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY50	QY50	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Fuse not replaceable)
	AY51	QY50 *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32=16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
	AY51-S1	QY50 *1	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32 = 16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Fuse not replaceable)
	AY51-UL	QY50	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (32 = 16 × 2) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
	AY60	QY68A	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Required (48VDC not applicable) Change in rated output current: Not required 5) Change in functions : Required (Fuse not replaceable, independent common)

*1 Replacing with the Q series large type I/O module is possible. For details, refer to Section 3.1.2.

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY60E	QY68A	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Required (48VDC not applicable) Change in rated output current: Not required 5) Change in functions : Required (No fuse, independent common)
	AY60S	QY68A	1) Change in external wiring: Required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Required (16 points → 32 points (16 points × 2 modules)) Change in the number of output points: 16 points × 1 module → 8 points × 2 modules 4) Change in specifications Change in rated output voltage: Required (48VDC not applicable) Change in rated output current: Not required 5) Change in functions : Required (No fuse, independent common)
	AY70	QY70	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
	AY71	QY71	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY72	QY71	1) Change in external wiring: Not required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (64 points → 32 points × 2 modules) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
	AY80	QY80	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Required (Fuse not replaceable)
	AY81	QY81P	1) Change in external wiring: Required (Connector terminal block must be converted.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Required (from 0.5A to 0.1A) 5) Change in functions : Not required
	AY82-EP	QY81P	1) Change in external wiring: Not required 2) Change in the number of slots: Required (2 modules required) 3) Change in a program Change in the number of occupied I/O points: Not required (64 points → 32 points × 2 modules) 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required
		QY82P	1) Change in external wiring: Required (37-pin connector → 40-pin connector) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Not required Change in rated output current: Not required 5) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
I/O module	AH42	QH42P	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Required (64 points → 32 points) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Required (Protection function equipped)
		QX41Y41P	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required (64 points occupied) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Required (Protection function equipped)
Dynamic scan I/O module	A42XY	None	Use both QX42 and QY42P and converting I/O signal from dynamic to static.
Dummy module	AG62	None	[Dummy module function] Alternating with QG60 and I/O assignment setting is recommended. [Simulation switch function] Alternating with QX40 and external switch is recommended.
Blanking module	AG60	QG60	No restrictions

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Interrupt module	AI61	QI60	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Required (32 points → 16 points) 4) Change in specifications Change in rated input voltage: Required (12VDC not applicable) Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required
	AI61-S1	QI60	1) Change in external wiring: Required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Required (32 points → 16 points) 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions : Not required 6) Others: The response time is different.

3.1.2 List of alternative Q series large type module models

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Input module	AX11	QX11L	1) Change in external wiring: Not required (Existing terminal block can be utilized.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Not required Change in ON voltage/ON current: Not required Change in OFF voltage/OFF current: Required Change in input resistance: Not required 5) Change in functions : Not required
	AX21	QX21L	
Output module	AY10A	QY11AL	1) Change in external wiring: Not required (Existing terminal block can be utilized.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Not required Change in leakage current at OFF AY10A → QY11AL: Required (0mA → 0.1mA) AY11A → QY11AL: Not required (0.1mA) 5) Change in functions AY10A → QY11AL: Required (Varistor Not required → required) AY11A → QY11AL: Not required (Varistor Required)
	AY11A		
	AY13	QY13L	1) Change in external wiring: Not required (Existing terminal block can be utilized.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated input voltage: Not required Change in rated input current: Not required 5) Change in functions : Not required
	AY23	QY23L	1) Change in external wiring: Not required (Existing terminal block can be utilized.) 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required Change in rated input voltage: Not required Change in rated input current: Not required Change in leakage current at OFF: Not required 4) Change in functions : Not required

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Output module	AY51	QY51PL	1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Required (28.8VDC or more not applicable) Change in rated output current: Not required 5) Change in functions : Required (Surge suppressor: Varistor → Zener diode, Protection function: Not supported → Supported)
	AY51-S1		1) Change in external wiring: Not required 2) Change in the number of slots: Not required 3) Change in a program Change in the number of occupied I/O points: Not required 4) Change in specifications Change in rated output voltage: Required (28.8VDC or more not applicable) Change in rated output current: Not required 5) Change in functions : Required (Surge suppressor: Transistor built-in zener diode → Zener diode, Protection function: Not supported → Supported, Fuse blown indication: Supported → Not supported)

Point

Refer to the following for the specifications of each Q series large type module.
"5.6 Q Series Large Type Base Unit and Q Series Large Type I/O Module"

3.2 I/O Module Specifications Comparison

3.2.1 Input module specifications comparison

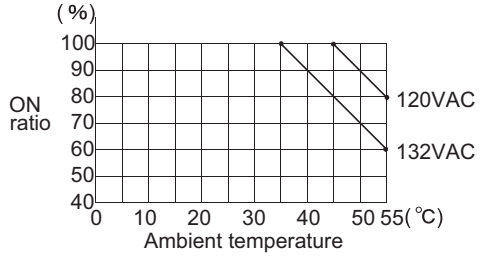
(1) Specifications comparison between AX10 and QX10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX10	QX10	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		within 5%	within 5%	○	
Rated input current		10mA (100VAC 60Hz)	Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	△	Reduced. *1
Inrush current		Max. 300mA within 0.3ms (132VAC)	Max. 200mA within 1ms (132VAC)	○	
Operating voltage range		85 to 132VAC (50/60Hz ± 5%)	85 to 132VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		100% (16 points) Simultaneously ON	Refer to the derating chart. *2	△	Use within the range shown in the derating figure.
ON voltage/ON current		80VAC or more/ 6mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
OFF voltage/OFF current		40VAC or less/ 4mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced.*1
Input resistance		Approx. 10kΩ (60Hz), Approx. 12kΩ (50Hz)	Approx. 12kΩ (60Hz), Approx. 15kΩ (50Hz)	△	Input resistance has increased.*1
Response time	OFF to ON	15ms or less	15ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		16 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less.)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.39kg	0.17kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX10.

*2 The following shows the derating chart.



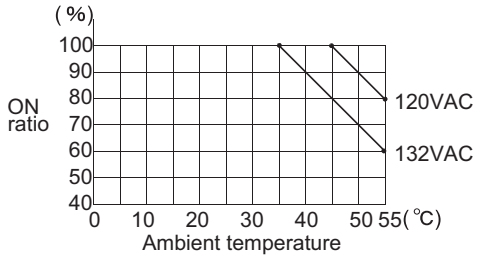
(2) Specifications comparison between AX11 and QX10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX11	QX10	Compat-ibility	Precautions for replacement
Number of input points		32 points	16 points	△	Use two QX10s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		within 5%	within 5%	○	
Rated input current		10mA (100VAC 60Hz)	Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	△	Reduced. *1
Inrush current		Max. 300mA within 0.3ms (132VAC)	Max. 200mA within 1ms (132VAC)	○	
Operating voltage range		85 to 132VAC (50/60Hz ± 5%)	85 to 132VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		60% (20 points) Simultaneously ON	Refer to the derating chart. *2	○	
ON voltage/ON current		80VAC or more/6mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced. *1
Input resistance		Approx. 10kΩ (60Hz), Approx. 12kΩ (50Hz)	Approx. 12kΩ (60Hz), Approx. 15kΩ (50Hz)	△	Input resistance has increased. *1
Response time	OFF to ON	15ms or less	15ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	16 points/common (Common terminal:TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.11A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D)mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.49kg	0.17kg	○	

*1 Check the specifications of the sensor or switches to connected to the QX10.

*2 The following shows the derating chart.



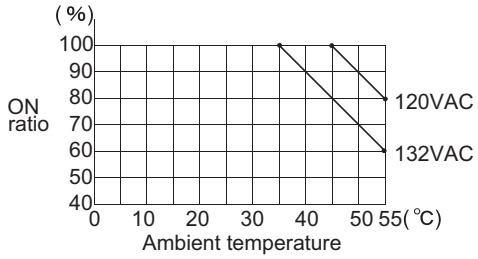
(3) Specifications comparison between AX11EU and QX10

○:Compatible, △: Partial change required, ×: Incompatible

Specification		AX11EU	QX10	Compat-ibility	Precautions for replacement
Number of input points		32 points	16 points	△	Use two QX10s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		12mA (120VAC 60Hz)	Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	△	Reduced. *1
Inrush current		Max. 300mA within 1ms (132VAC)	Max. 200mA within 1ms (132VAC)	○	
Operating voltage range		85 to 132 VAC (50/60Hz ± 5%)	85 to 132VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		60% (20 points) Simultaneously ON	Refer to the derating chart.*2	○	
ON voltage/ON current		79VAC or more/6mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced. *1
input resistance		Approx. 10kΩ (60Hz), Approx. 12kΩ (50Hz)	Approx. 12kΩ (60Hz), Approx. 15kΩ (50Hz)	△	Input resistance has increased. *1
Response time	OFF to ON	15ms or less (100VAC 60Hz)	15ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less (100VAC 60Hz)	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	16 points/common (Common terminal:TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3.5 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.15A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
Dielectric withstand voltage (Across external circuit and internal circuit)		1780VAC rms/3cycles (Altitude 2,000m (6557.38ft.))	1780VAC rms/3cycles (Altitude 2,000m (6557.38ft.))	○	
Insulation resistance		10MΩ or more by insulation resistance tester	10MΩ or more by insulation resistance tester	○	
Noise durability		IEC801-4 : 1kV	By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency First transient noise IEC61000-4-4: 1kV	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.50kg	0.17kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX10.

*2 The following shows the derating chart.

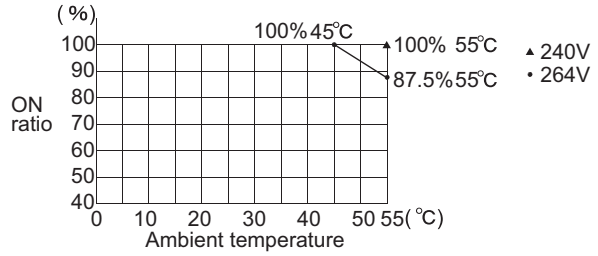


(4) Specifications comparison between AX20 and QX28

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX20	QX28	Compat-ibility	Precautions for replacement
Number of input points		16 points	8 points (16 points occupied)	△	Use two QX28s when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	100-240VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		10mA (200VAC 60Hz)	Approx. 17mA (200VAC, 60Hz), Approx. 14mA (200VAC, 50Hz), Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	○	
Inrush current		Max. 600mA within 0.12ms (264VAC)	Max. 500mA within 1ms (264VAC)	○	
Operating voltage range		170 to 264VAC (50/60Hz ± 5%)	85 to 264VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		100% (16 points) Simultaneously ON	Refer to the derating chart. *1	△	Use within the range shown in the derating figure.
ON voltage/ON current		160VAC or more/ 5.5mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced. *2
Input resistance		Approx. 22kΩ (60Hz), Approx. 24kΩ (50Hz)	Approx. 12kΩ (60Hz) , Approx. 15kΩ (50Hz)	○	
Response time	OFF to ON	15ms or less	10ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		16 points/common (Common terminal:TB9, TB18)	8 points/common (Common terminal:TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.05A (TYP. all points ON)	△	Review current capacity when using two or more QX28s since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76(D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.38kg	0.20kg	△	Calculate weight carefully when using 2 QX28s or more since the weight is increased in that use.

*1 The following shows the derating chart.



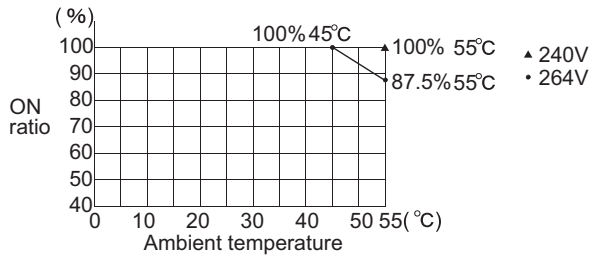
*2 Check the specifications of the sensor or switches to be connected to the QX28.

(5) Specifications comparison between AX21 and QX28

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX21	QX28	Compat-ibility	Precautions for replacement
Number of input points		32 points	8 points (16 points occupied)	△	Use the appropriate number of QX28s when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	100-240VAC 50/60Hz	○	
Input voltage distortion		within 5%	within 5%	○	
Rated input current		10mA (220VAC 60Hz)	Approx. 17mA (200VAC, 60Hz), Approx. 14mA (200VAC, 50Hz), Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	○	
Inrush current		Max. 600mA within 0.12ms (264VAC)	Max. 500mA within 1ms (264VAC)	○	
Operating voltage range		170 to 264VAC (50/60Hz ± 5%)	85 to 264VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		60% (20 points) Simultaneously ON	Refer to the derating chart. *1	○	
ON voltage/ON current		160VAC or more/ 5.5mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced. *2
Input resistance		Approx. 22kΩ (60Hz), Approx. 24kΩ (50Hz)	Approx. 12kΩ (60Hz), Approx. 15kΩ (50Hz)	○	
Response time	OFF to ON	15ms or less	10ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	8 points/common (Common terminal:TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.11A (TYP. all points ON)	0.05A (TYP. all points ON)	△	Review current capacity when using three or more QX28s since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.50kg	0.20kg	△	Calculate weight carefully when using 3 QX28s or more since the weight is increased in that use.

*1 The following shows the derating chart.



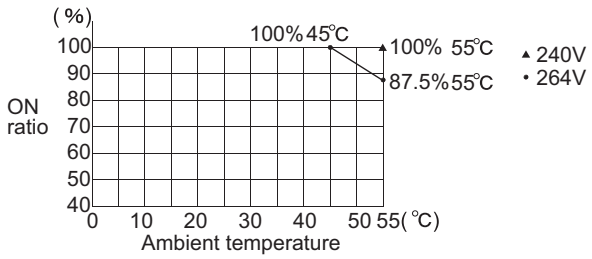
*2 Check the specifications of the sensor or switches to be connected to the QX28.

(6) Specifications comparison between AX21EU and QX28

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX21EU	QX28	Compat-ibility	Precautions for replacement
Number of input points		32 points	8 points (16 points occupied)	△	Use the appropriate number of QX28s when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	100-240VAC 50/60Hz	○	
Input voltage distortion		within 5%	within 5%	○	
Rated input current		Approx. 12mA (240VAC 60Hz)	Approx. 17mA (200VAC, 60Hz), Approx. 14mA (200VAC, 50Hz), Approx. 8mA (100VAC, 60Hz), Approx. 7mA (100VAC, 50Hz)	○	
Operating voltage range		170 to 264VAC (50/60Hz ± 5%)	85 to 264VAC (50/60Hz ± 3Hz)	○	
Maximum number of simultaneous input points		60% (20 points) Simultaneously ON	Refer to the derating chart. *1	○	
ON voltage/ON current		160VAC or more/ 5.5mA or more	80VAC or more/5mA or more (50Hz, 60Hz)	○	
Inrush current		Max. 600mA within 0.5ms (264VAC)	Max. 500mA within 1ms (264VAC)	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1.7mA or less (50Hz, 60Hz)	△	Reduced. *2
Input resistance		Approx. 22kΩ (60Hz), Approx. 24kΩ (50Hz)	Approx. 12kΩ (60Hz), Approx. 15kΩ (50Hz)	○	
Response time	OFF to ON	15ms or less (200VAC 60Hz)	10ms or less (100VAC 50Hz, 60Hz)	○	
	ON to OFF	25ms or less (200VAC 60Hz)	20ms or less (100VAC 50Hz, 60Hz)	○	
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	8 points/common (Common terminal:TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.15A (TYP. all points ON)	0.05A (TYP. all points ON)	△	Review current capacity when using three or more QX28s since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.50kg	0.20kg	△	Calculate weight carefully when using 3 QX28s or more since the weight is increased in that use.

*1 The following shows the derating chart.



*2 Check the specifications of the sensor or switches to be connected to the QX28.

(7) Specifications comparison between AX31 and QX41

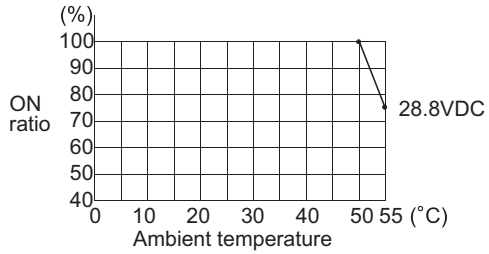
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX31	QX41	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC, 12/24VAC (50/60Hz)	24VDC	×	12/24VAC and 12VDC are not applicable. *1
Rated input current		8.5mA (24VDC/AC), 4mA (12VDC/AC)	Approx. 4mA	△	Reduced. *2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%), 10.2 to 26.4VAC (50/60Hz ± 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12/24VAC and 12VDC are not applicable. *1
Maximum number of simultaneous input points		100% Simultaneously ON	Refer to the derating chart. *3	△	Use within the range shown in the derating figure.
ON voltage/ON current		7VDC/AC or more/ 2mA or more	19VDC or more/3mA or more	×	12/24VAC and 12VDC are not applicable. *1
OFF voltage/OFF current		2.5VDC/AC or less /0.7mA or less	11VDC or less/1.7mA or less	×	12/24VAC and 12VDC are not applicable. *1
Input resistance		Approx. 2.7kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	20ms or less (12/24VDC) , 25ms or less (12/24VAC 60Hz)	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 20 ms.
	ON to OFF	20ms or less (12/24VDC) , 20ms or less (12/24VAC 60Hz)	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 20 ms.
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required. *4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.49kg	0.15kg	○	

*1 For use of 12/24VAC, externally convert it into direct current before input.
In the case of 12VDC, use the QX71.

*2 Check the specifications of the sensor or switches to be connected to the QX41.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

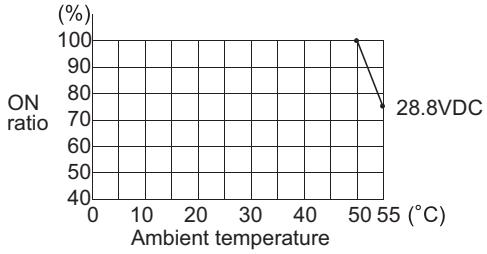
(8) Specifications comparison between AX31-S1 and QX41

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX31-S1	QX41	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	24VDC	○	
Rated input current		8.5mA	Approx. 4mA	△	Reduced. *1
Operating voltage range		19.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	20.4VDC or more are required.
Maximum number of simultaneous input points		100% Simultaneously ON	Refer to the derating chart. *2	△	Use within the range shown in the derating figure.
ON voltage/ON current		16VDC or more/5mA or more	19VDC or more/3mA or more	△	19VDC or more are required to turn on.
OFF voltage/OFF current		8VDC or less/2mA or less	11VDC or less/1.7mA or less	△	Reduced. *1
Input resistance		Approx. 2.7kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *1
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required. *3
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.49kg	0.15kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX41.

*2 The following shows the derating chart.



*3 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(9) Specifications comparison between AX40 and QX40

○:Compatible, △: Partial change required, ×: Incompatible

Specification		AX40	QX40	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable. *1
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 4mA	△	Reduced. *2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable. *1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable. *1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable. *1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal:TB9, TB18)	16 points/common (Common terminal:TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.16kg	○	

*1 Use the QX70 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX40.

(10)Specifications comparison between AX40 and QX70

○:Compatible, △: Partial change required, ×: Incompatible

Specification		AX40	QX70	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 4mA/Approx. 10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal:TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.055A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

*1 Use the QX40(-S1) at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX70.

(11) Specifications comparison between AX40-UL and QX40

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX40-UL	QX40	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable. *1
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 4mA	△	Reduced. *2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable. *1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable. *1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable. *1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal:TB9, TB18)	16 points/common (Common terminal:TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.16kg	○	

*1 Use the QX70 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX40.

(12)Specifications comparison between AX40-UL and QX70

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX40-UL	QX70	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 4mA/Approx. 10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal:TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.055A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

*1 Use the QX40(-S1) at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX70.

(13)Specifications comparison between AX41 and QX41

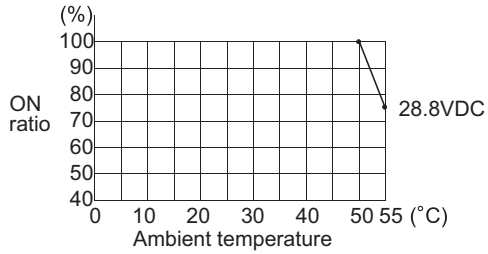
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41	QX41	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable. *1
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 4mA	△	Reduced. *2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable. *1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable. *1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable. *1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(14)Specifications comparison between AX41 and QX41-S2

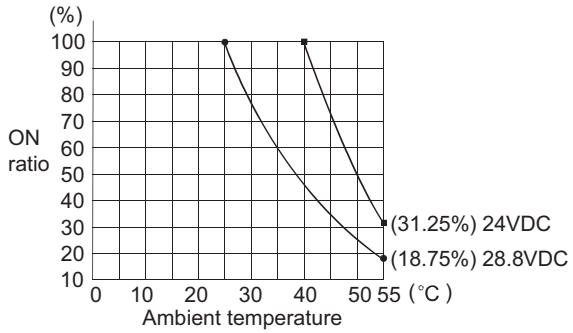
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41	QX41-S2	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 6mA	△	Rated input current has decreased.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (22 AWG) (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41-S2.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(15)Specifications comparison between AX41 and QX71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41	QX71	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 4mA/Approx. 10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (22 AWG) (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.07A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.12kg	○	

*1 Use the QX41(-S2) at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX71.

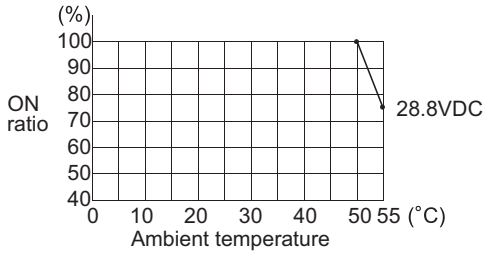
(16)Specifications comparison between AX41-S1 and QX41-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41-S1	QX41-S1	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 4mA	△	Reduced. *1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *2	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.
OFF voltage/OFF current		6VDC or less/1.5mA or less	9.5VDC or less/1.5mA or less	△	12VDC are not applicable.
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *1
Response time	OFF to ON	0.1ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.1 ms.
	ON to OFF	0.2ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.1 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required. *3
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX41-S1.

*2 The following shows the derating chart.



*3 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(17)Specifications comparison between AX41-UL and QX41

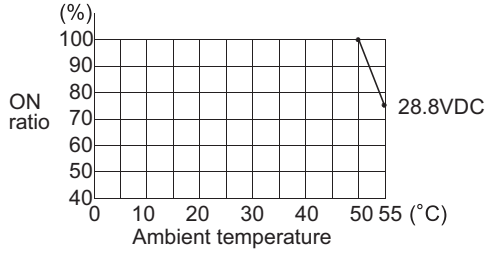
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41-UL	QX41	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 4mA/ Approx. 10mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 point/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(18)Specifications comparison between AX41-UL and QX41-S2

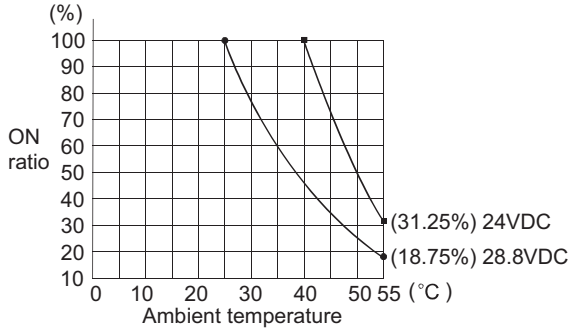
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41-UL	QX41-S2	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 4mA/ Approx. 10mA	Approx. 6mA	△	Rated input current has decreased.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 point/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal:B01, B02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41-S2.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36, etc.), conversion to the terminal block is possible.

(19)Specifications comparison between AX41-UL and QX71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41-UL	QX71	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 4mA/ Approx. 10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 point/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.07A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.12kg	○	

*1 Use the QX41(-S1) at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX71.

(20)Specifications comparison between AX42 and QX42

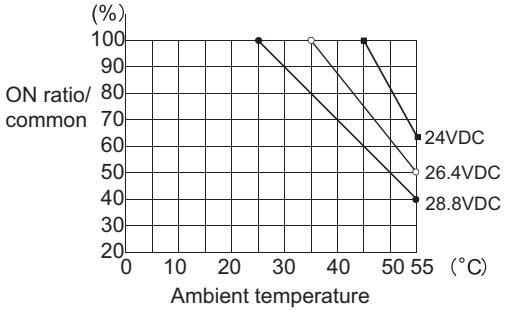
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX42	QX42	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (20point/common) Simultaneously ON	Refer to the derating chart.*3	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/ 3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/ 1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1B1, 1B2, 2B1, 2B2)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		40pin connector (With solder) × 2	40 pin connector × 2 (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Current consumption		0.12A (TYP. all points ON)	0.09A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W)× 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.51kg	0.18kg	○	

*1 Use the QX72 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX42.

*3 The following shows the derating chart.



(21)Specifications comparison between AX42 and QX41-S2

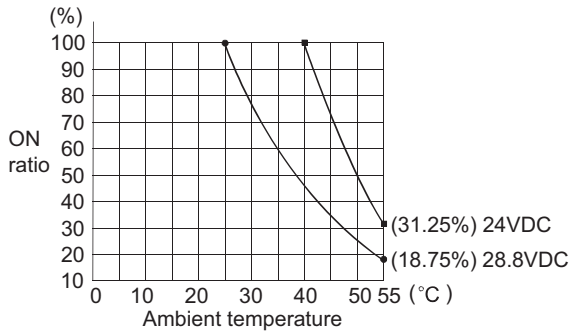
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX42	QX41-S2	Compat-ibility	Precautions for replacement
Number of input points		64 points	32 points	△	Use two QX41-S2s when using 33 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 6mA	△	Rated input current has decreased.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (20point/common) Simultaneously ON	Refer to the derating chart. *3	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/ 3mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/ 1.5mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 3.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1B1, 1B2, 2B1, 2B2)	32 points/common (Common terminal:B01, B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED)	○	
External connection method		40pin connector (With solder) × 2	40 pin connector (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		0.3mm^2	0.3mm^2 (22 AWG) (For A6CON1 or A6CON4)	○	
Current consumption		0.12A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.51kg	0.15kg	○	

*1 Use the QX72 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41-S2.

*3 The following shows the derating chart.



(22)Specifications comparison between AX42 and QX72

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX42	QX72	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		60% (20point/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/ 3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/ 1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 3.3kΩ	○	
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1B1, 1B2, 2B1, 2B2)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		40pin connector (With solder) × 2	40 pin connector (Option)	○	The 40 pin connectors are sold separately. Purchase two pin connectors separately.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Current consumption		0.12A (TYP. all points ON)	0.085A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.51kg	0.13kg	○	

*1 Use the QX41-S2/QX42 at 24VDC.

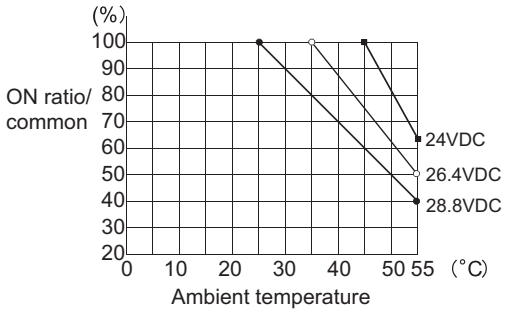
(23)Specifications comparison between AX42-S1 and QX42-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX42-S1	QX42-S1	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 4mA	△	Reduced.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.
Maximum number of simultaneous input points		60% (20 point/common) Simultaneously ON	Refer to the derating chart. *2	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.
OFF voltage/OFF current		6VDC or less/1.5mA or less	9.5VDC or less/1.5mA or less	△	12VDC are not applicable.
Input resistance		Approx. 3.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*1
Response time	OFF to ON	0.5ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.4 ms.
	ON to OFF	0.5ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.4 ms.
Common terminal arrangement		32 points/common (Common terminal: 1B1, 1B2, 2B1, 2B2)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		40 pin connector (With solder) × 2	40 pin connector × 2 (Option)	○	
Applicable wire size		0.3mm^{c}	0.3mm^2 (For A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	-	×	The 40 pin connectors are sold separately. Purchase them separately.
Current consumption		0.12A (TYP. all points ON)	0.09A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.51kg	0.18kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX42-S1.

*2 The following shows the derating chart.



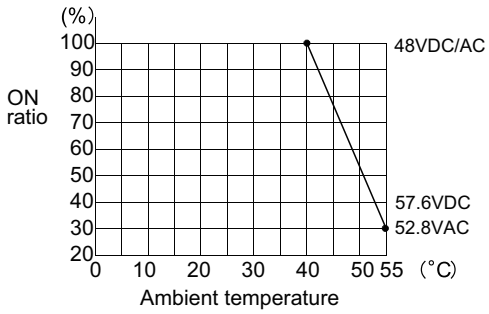
(24)Specifications comparison between AX50(S1) and QX50

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX50(S1) *1	QX50		Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points		○	
Insulation method		Photocoupler	Photocoupler		○	
Rated input voltage		48VDC	48VDC	48VAC	○	
Rated input current		4mA	Approx. 4mA		○	
Operating voltage range		38.4 to 57.6VDC (Ripple ratio within 5%)	40.8 to 57.6VDC (Ripple ratio within 5%)	40.8 to 52.8VAC (Ripple ratio within 5%)	○	
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	Refer to the derating chart. *2		△	Use it within the range shown in the derating chart.
ON voltage/ON current		34VDC or more 3.0mA or more	28VDC or more/2.5mA or more		○	
OFF voltage/OFF current		10VDC or less 1.0mA or less	10VDC or less/1.0mA or less		○	
Input resistance		Approx. 11kW	Approx. 11.2kW		○	
Response time	OFF to ON	10ms or less	5ms or less	15ms or less	○	
	ON to OFF	10ms or less	20ms or less	20ms or less	○	
Common terminal arrangement		8 points/common (Common terminal : TB9, TB18)	16 points/common (Common terminal:TB17)		△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)		○	Wiring change is required.
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)		×	
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 68.6N cm)	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)		×	
Applicable solderless terminal		R1.25-3, R2-3 RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)		×	
Current consumption		55mA (TYP. all points ON)	50mA (TYP. all points ON)		○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)		△	Wiring space is narrow.
Weight		0.37kg	0.13kg		○	

*1 The AX50 is sink type module and the AX50-S1 is sink/source type module.
The specifications of the AX50 and AX50-S1 shown on the table above are the same.

*2 The following shows the derating chart.



(25)Specifications comparison between AX70 and QX70

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX70	QX70	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		5V/12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		3.5mA/2mA/4.5mA (TYP), 5.5mA/3mA/6mA (MAX)	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		4.5 to 5.5VDC (SW ON), 10.2 to 26.4VDC (SW OFF)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		3.5VDC or more/1.0mA or more (SW ON), 5VDC or more/1.0mA or more (SW OFF)	3.5VDC or more/1mA or more	○	
OFF voltage/OFF current		1.1VDC or less/ 0.2mA or less (SW ON), 2VDC or less/ 0.2mA or less (SW OFF)	1VDC or less/0.1mA or less	△	Reduced.*2
Input resistance		Approx. 1.4kΩ (SW ON), Approx. 5.5kΩ (SW OFF)	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	1.5ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 1 ms.
	ON to OFF	3ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 1 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.055A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

*1 Use the QX40-S1 at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX70.

(26)Specifications comparison between AX71 and QX71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX71	QX71	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		5V/12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		3.5mA/2mA/4.5mA (TYP), 5.5mA/3mA/6mA (MAX)	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		4.5 to 5.5VDC (SW ON), 10.2 to 26.4VDC (SW OFF)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		3.5VDC or more/ 1.0mA or more (SW ON), 5VDC or more/ 1.0mA or more (SW OFF)	3.5VDC or more/1mA or more	○	
OFF voltage/OFF current		1.1VDC or less/ 0.2mA or less (SW ON), 2VDC or less/ 0.2mA or less (SW OFF)	1VDC or less/0.1mA or less	△	Reduced.*2
Input resistance		Approx. 1.4kΩ (SW ON) , Approx. 5.5kΩ (SW OFF)	Approx. 3.3kΩ	△	The input resistance of the QX71 is greater than that of the AX71 SW ON status.
Response time	OFF to ON	1.5ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 1 ms.
	ON to OFF	3ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 1 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.07A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.12kg	○	

*1 Use the QX41-S1 at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX71.

(27)Specifications comparison between AX80 and QX80

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX80	QX80	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		4mA/10mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB18)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.16kg	○	

*1 Use the QX70 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX80.

(28)Specifications comparison between AX80 and QX70

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX80	QX70	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		4mA/10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.055A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W)× 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

*1 Use the QX80 at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX70.

(29)Specifications comparison between AX80E and QX82-S1

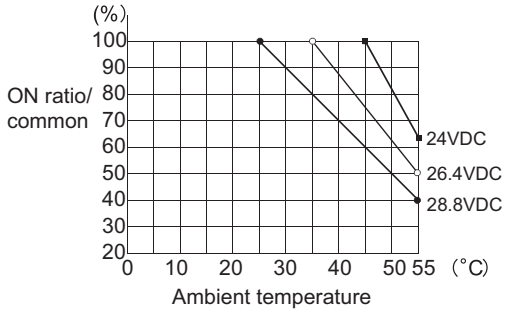
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX80E	QX82-S1	Compat-ibility	Precautions for replacement
Number of input points		16 points	64 points	△	Set 16 points in the I/O assignment of Parameter.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		4mA/10mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	Refer to the derating chart. *3	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/2.6mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.0mA or less	9.5VDC or less/1.5mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	5.5ms (TYP.)	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Set the input response time of parameters to 1 ms.
	ON to OFF	6.0ms (TYP.)	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Set the input response time of parameters to 1 ms.
Response time high-speed mode (upper 8 points only)	OFF to ON	0.5ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Set the input response time of parameters to 0.4 ms.
	ON to OFF	1.0ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Set the input response time of parameters to 0.4 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED) 32 point switch-over using switch	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	40 pin connector × 1 (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.055A (TYP. all points ON)	0.09A (TYP. all points ON)	△	Reviewing power supply capacity is required.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.36kg	0.18kg	○	

*1 Use the QX70 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX82-S1.

*3 The following shows the derating chart.



(30)Specifications comparison between AX80E and QX70

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX80E	QX70	Compat-ibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		4mA/10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		100% (8 points/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/2.6mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.0mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	5.5ms (TYP.)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 5 ms.
	ON to OFF	6.0ms (TYP.)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 5 ms.
Response time high-speed mode (upper 8 points only)	OFF to ON	0.5ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting)	△	Set the input response time of parameters to 1 ms.
	ON to OFF	1.0ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting)	○	Set the input response time of parameters to 1 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.055A (TYP. all points ON)	0.055A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

*1 Use the QX82-S1 at 24VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX70.

(31)Specifications comparison between AX81 and QX81

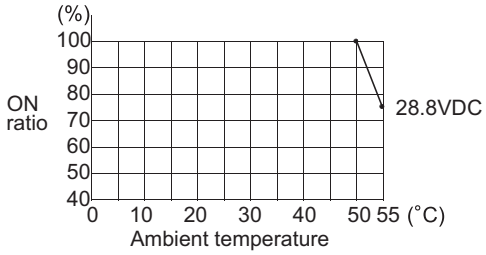
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81	QX81	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		4mA/10mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX81.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBX36-E, etc.) conversion to the terminal block is possible.

(32)Specifications comparison between AX81 and QX81-S2

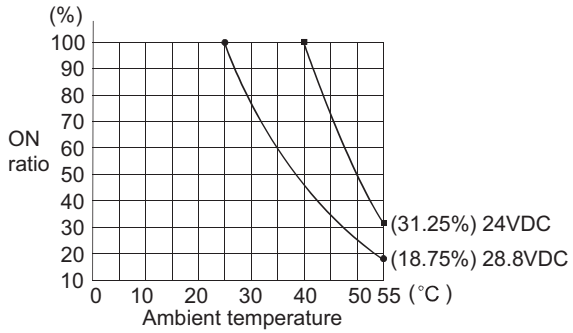
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81	QX81-S2	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		4mA/10mA	Approx. 6mA	△	Rated input current has decreased.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		9.5VDC or more/3mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX81-S2.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBXY36-E, etc.), conversion to the terminal block is possible.

(33)Specifications comparison between AX81 and QX71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81	QX71	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		4mA/10mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.5mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.11A (TYP. all points ON)	0.07A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.12kg	○	

*1 Use the QX81(-S2) at 24VDC.

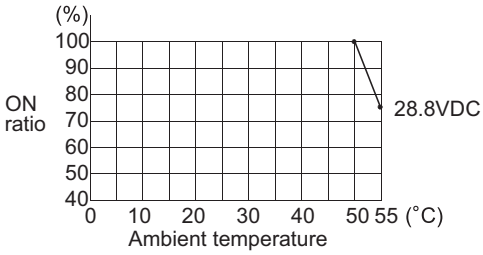
*2 Check the specifications of the sensor or switches to be connected to the QX71.

(34)Specifications comparison between AX81B and QX81

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81B	QX81	Compat-ibility	Precautions for replacement
Number of input points		32 points (64 points occupied)	32 points	△	Set 64 points in the I/O assignment of Parameter.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	24VDC	○	
Rated input current		7mA (When turning ON an external switch) 1.5mA (When turning OFF an external switch)	Approx. 4mA	×	The wire breakage detection function is not provided.
Operating voltage range		21.6 to 30VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	Voltage over 28.8VDC is not applicable.
Maximum number of simultaneous input points		60% (5 points/common) Simultaneously ON	Refer to the derating chart. *1	○	
ON voltage/ON current		21.0VDC or more/5.4mA or more (Normal input) 1.0VDC or less/0.2mA or less (Wire breakage detection)	19VDC or more/3mA or more	×	The wire breakage detection function not provided.
OFF voltage/OFF current		7.0VDC or less/1.9mA or less (Normal input) 6.0VDC or more/1.3mA or more (Wire breakage detection)	11VDC or less/1.7mA or less	×	The wire breakage detection function not provided.
Input resistance		Approx. 3.6kΩ (Normal input) Approx. 4.3kΩ (Wire breakage detection)	Approx. 5.6kΩ	×	The wire breakage detection function not provided.
Wire breakage detection		Provided	Not provided	×	The wire breakage detection function not provided.
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
External resistance		0.1kΩ or less (At turning ON) 11.4 to 12.7kΩ or less (At turning OFF) 150kΩ or more (At wire breakage detection)	–	–	Since the wire breakage detection function is not provided, the external resistance is not required.
Parallel resistance with external switch		12kΩ (Tolerance: ±5%, 1/4W or more)	–	–	Since the wire breakage detection function is not provided, the external resistance is not required.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required. *2
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3 RAV1.25-3, RAV2-3	–	×	
Current consumption		0.125A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 The following shows the derating chart.



*2 By using connectors/terminal block converter modules (A6TBX36-E, etc.) conversion to the terminal block is possible.

(35)Specifications comparison between AX81-S1 and QX81

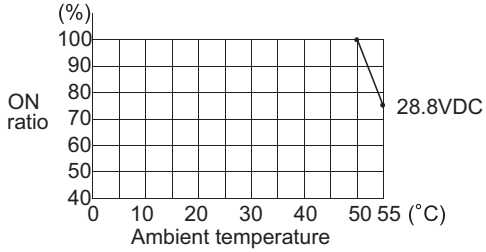
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S1	QX81	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		2.5mA/5mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *3	○	
ON voltage/ON current		5.6VDC or more/ 1.1mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		2.4VDC or less/0.39mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 4.8kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required.*4
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.105A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX81.

*3 The following shows the derating chart.



*4 By using connectors/terminal block converter modules (A6TBX36-E, etc.) conversion to the terminal block is possible.

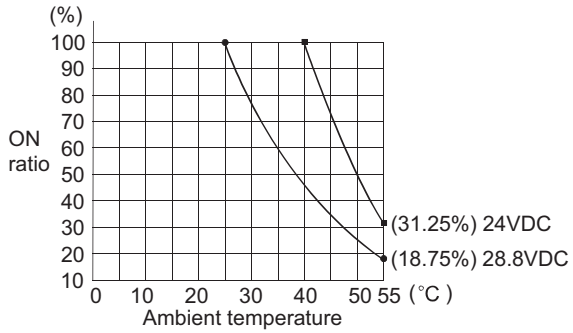
(36)Specifications comparison between AX81-S1 and QX81-S2

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S1	QX81-S2	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		2.5mA/5mA	Approx. 6mA	○	
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *2	○	
ON voltage/ON current		5.6VDC or more/ 1.1mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		2.4VDC or less/0.39mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 4.8kΩ	Approx. 3.6kΩ	△	Input resistance is lower.
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required.*3
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.105A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 Use the QX71 at 12VDC.

*2 The following shows the derating chart.



*3 By using connectors/terminal block converter modules (A6TBXY36-E, etc.), conversion to the terminal block is possible.

(37)Specifications comparison between AX81-S1 and QX71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S1	QX71	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		2.5mA/5mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	100% Simultaneously ON	○	
ON voltage/ON current		5.6VDC or more/ 1.1mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		2.4VDC or less/0.39mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 4.8kΩ	Approx. 3.3kΩ	○	
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: B01, B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.105A (TYP. all points ON)	0.07A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.12kg	○	

*1 Use the QX81(-S2) at 24VDC.

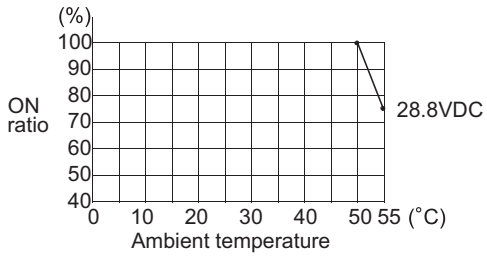
(38)Specifications comparison between AX81-S2 and QX81

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S2	QX81	Compat-ibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		48V/60VDC	24VDC	×	Voltage over 28.8VDC is not applicable.*1
Rated input current		3mA/4mA	Approx. 4mA	○	
Operating voltage range		41 to 66VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	×	Voltage over 28.8VDC is not applicable.*1
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *2	○	
ON voltage/ON current		31VDC or more/ 1.7mA or more	19VDC or more/3mA or more	×	Voltage over 28.8VDC is not applicable.*1
OFF voltage/OFF current		10VDC or less/0.5mA or less	11VDC or less/1.7mA or less	×	Voltage over 28.8VDC is not applicable.*1
Input resistance		Approx. 18kΩ	Approx. 5.6kΩ	○	
Response time	OFF to ON	20ms or less (60VDC)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 20 ms.
	ON to OFF	20ms or less (60VDC)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Set the input response time of parameters to 20 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector (Option)	×	Wiring change is required.*3
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.110A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.16kg	○	

*1 For use of 48VDC, connect a resistor of 5.6kΩ(1/2W or more) in series with the external signal line connected between QX81 and an external device.
For use of 60VDC, connect a resistor of 8.2kΩ(1W or more) in series with the external signal line connected between QX81 and an external device.

*2 The following shows the derating chart.



*3 By using connectors/terminal block converter modules (A6TBX36-E, etc.) conversion to the terminal block is possible.

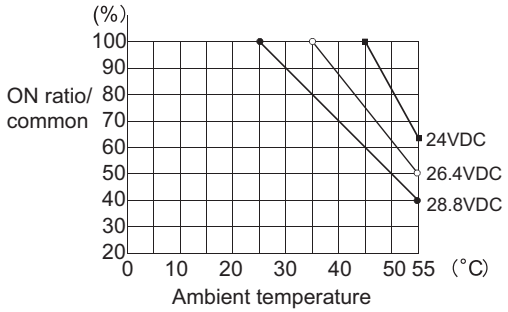
(39)Specifications comparison between AX81-S3 and QX82-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S3	QX82-S1	Compat-ibility	Precautions for replacement
Number of input points		32 points	64 points	△	Set 32 points in the I/O assignment of Parameter.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.
Rated input current		4mA/10mA	Approx. 4mA	△	Reduced.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.
Maximum number of simultaneous input points		60% (5 point/common) Simultaneously ON	Refer to the derating chart. *2	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.
OFF voltage/OFF current		6VDC or less/1.5mA or less	9.5VDC or less/1.5mA or less	△	12VDC are not applicable.
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*1
Response time	OFF to ON	0.1ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.1 ms.
	ON to OFF	0.2ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Set the input response time of parameters to 0.1 ms.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	△	As the common changes from four commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED) 32 point switch-over using switch	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40 pin connector × 1 (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
Current consumption		0.110A (TYP. all points ON)	0.09A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.45kg	0.18kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QX82-S1.

*2 The following shows the derating chart.



(40)Specifications comparison between AX82 and QX82

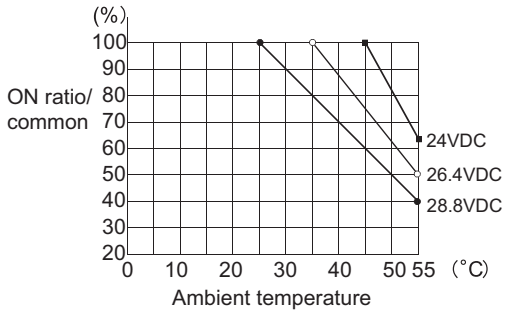
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX82	QX82	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 4mA	△	Reduced.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		40points (When located next to the power supply module : 26points)	Refer to the derating chart. *3	△	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/ 2.6mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.0mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1-17, 1-18, 1-36, 2-17, 2-18, 2-36)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		37 pin D-sub connector (Soldered) × 2	40 pin connector × 2 (Option)	×	Connector change is required.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Accessory		Tow external wiring D-sub connectors	–	×	The 40 pin connectors are sold separately. Purchase them separately.
Current consumption		0.12A (TYP. all points ON)	0.090A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.60kg	0.18kg	○	

*1 Use the QX72 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX82.

*3 The following shows the derating chart.



(41)Specifications comparison between AX82 and QX81-S2

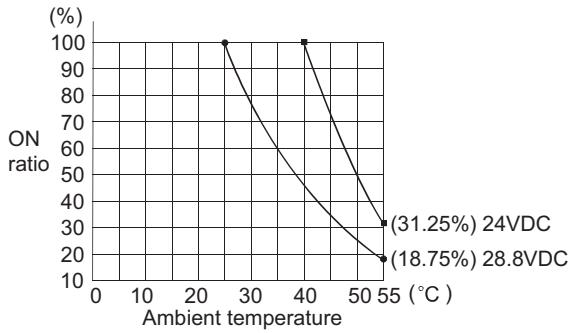
○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX82	QX81-S2	Compat-ibility	Precautions for replacement
Number of input points		64 points	32 points	△	Use two QX81-S2s when using 33 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 6mA	△	Rated input current has decreased.*2
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.*1
Maximum number of simultaneous input points		40points (When located next to the power supply module : 26points)	Refer to the derating chart. *3	○	Use within the range shown in the derating figure.
ON voltage/ON current		9.5VDC or more/ 2.6mA or more	15VDC or more/3mA or more	△	12VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.0mA or less	5VDC or less/1.7mA or less	△	12VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 3.6kΩ	△	Input resistance has increased.*2
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms/ 70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1-17, 1-18, 1-36, 2-17, 2-18, 2-36)	32 points/common (Common terminal: 17, 18, 36)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED)	○	
External connection method		37 pin D-sub connector (Soldered) × 2	37 pin D-sub connector (Option)	○	
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1E)	○	
Accessory		Tow external wiring D-sub connectors	–	×	The connector is sold separately. Purchase them separately.
Current consumption		0.12A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.60kg	0.16kg	○	

*1 Use the QX72 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX81-S2.

*3 The following shows the derating chart.



(42)Specifications comparison between AX82 and QX72

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX82	QX72	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	5V/12VDC	△	24VDC are not applicable.*1
Rated input current		Approx. 3mA/Approx. 7mA	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA	△	24VDC are not applicable.*1
Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	4.5 to 6VDC (Ripple ratio within 5%) 10.2 to 14.4VDC (Ripple ratio within 5%)	△	24VDC are not applicable.*1
Maximum number of simultaneous input points		40points (When located next to the power supply module : 26points)	100% Simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/ 2.6mA or more	3.5VDC or more/1mA or more	△	24VDC are not applicable.*1
OFF voltage/OFF current		6VDC or less/1.0mA or less	1VDC or less/0.1mA or less	△	24VDC are not applicable.*1
Input resistance		Approx. 3.4kΩ	Approx. 3.3kΩ	○	
Response time	OFF to ON	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	10ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) Initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		32 points/common (Common terminal: 1-17, 1-18, 1-36, 2-17, 2-18, 2-36)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		37 pin D-sub connector (Soldered) × 2	40 pin connector × 2 (Option)	○	
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Current consumption		0.12A (TYP. all points ON)	0.085A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.60kg	0.13kg	○	

*1 Use the QX81-S2/QX82 at 24VDC.

3.2.2 Output module specifications comparison

(1) Specifications comparison between AY10 and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY10	QY10	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		–	–		
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.44kg	0.22kg	○	

(2) Specifications comparison between AY10A and QY18A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY10A	QY18A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY18As when using 9 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 16A/all points	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/all points	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		Not provided (All points independent)	Not provided (All points independent)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.24A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.50kg	0.22kg	○	

(3) Specifications comparison between AY11 and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11	QY10	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Relay socket		Yes	None	×	Replace the module itself when its relay has a failure.
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	It is not applicable to use a different voltage for each eight points since the QY10 has only one common.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D)inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D)inch)	△	Wiring space is narrow.
Weight		0.50kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

(4) Specifications comparison between AY11A and QY18A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11A	QY18A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY18As when using 9 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 16A/all points	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/all points	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Common terminal arrangement		Not provided (All points independent)	Not provided (All points independent)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.24A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.47kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

(5) Specifications comparison between AY11AEU and QY18A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11AEU	QY18A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY18As when using 9 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 24VAC 2A (COSϕ=1)/point 16A/all points	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/all points	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (49.9VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		24VAC 1.5A (COSϕ=0.7) 200 thousand times or more 24VAC 0.75A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Common terminal arrangement		Not provided (All points independent)	Not provided (All points independent)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.24A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.47kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

(6) Specifications comparison between AY11E and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11E	QY10	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		250VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V8A	None	×	Fuses are not built in.*2
Fuse blow indicator		None	–	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.47kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

*2 Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(7) Specifications comparison between AY11EEU and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11EEU	QY10	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 24VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (49.9VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		24VAC 1.5A (COSϕ=0.7) 200 thousand times or more 24VAC 0.75A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V 8A	None	×	Fuses are not built in.*2
Fuse blow indicator		None	–	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (D) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.47kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

*2 Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(8) Specifications comparison between AY11-UL and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY11-UL	QY10	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	–	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Surge suppressor		Varistor (387 to 473V)	None	×	Varistors are not built in.*1
Relay socket		Yes	None	×	Replace the module itself when its relay has a failure.
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	150mA (24VDC TYP. all points ON)	–	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.12A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.50kg	0.22kg	○	

*1 Connect a varistor to reduce external noise.

(9) Specifications comparison between AY13 and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY13	QY10	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY10s when using 17 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 5A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	290mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.23A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.59kg	0.22kg	○	

(10)Specifications comparison between AY13E and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY13E	QY10	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY10s when using 17 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 5A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		250VAC 125VDC	264VAC 125VDC	○	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.7A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		None	None	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V8A	None	×	Fuses are not built in.*1
Fuse blow indicator		None	–	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	290mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.23A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D)mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.60kg	0.22kg	○	

*1 Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(11) Specifications comparison between AY13EU and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY13EU	QY10	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY10s when using 17 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 24VAC 2A (COSϕ=1)/point 5A/common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	264VAC 125VDC	○	
Leakage current at OFF		–	–	–	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		24VAC 1.5A (COSϕ=0.7) 200 thousand times or more 24VAC 0.75A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less	–	○	External power supply is not required.
	Current	290mA (24VDC TYP. all points ON)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.23A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.59kg	0.22kg	○	

(12)Specifications comparison between AY15EU and QY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY15EU	QY10	Compat-ibility	Precautions for replacement
Number of output points		24 points (32 points occupied)	16 points	△	Use two QY10s when using 17 points or more.
Insulation method		Photocoupler	Relay	△	Insulation method is different, but the performance is equivalent.
Rated switching voltage/ current		24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/ common	24VDC 2A (Resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 10mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		–	–	–	
Response time	OFF to ON	10ms or less	10ms or less	○	
	ON to OFF	12ms or less	12ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Replace the module more frequently since the life is approximately half.
		200VAC 2A, 240VAC 1.8A (COSϕ=0.7) 200 thousand times or more 200VAC 1.1A, 240VAC 0.9A (COSϕ=0.35) 200 thousand times or more 24VDC 1.1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COSϕ=0.7) 300 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A (COSϕ=0.35) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		None	None	○	
Common terminal arrangement		8 points/common (Common terminal: TB9, TB20, TB31)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24VDC ±10% Ripple voltage 4Vp-p or less (Must be SELV power supply)	–	○	External power supply is not required.
	Current	220mA (24VDC TYP. all points ON) (Must be SELV power supply)	–	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	

Specification	AY15EU	QY10	Compat-ibility	Precautions for replacement
Dielectric withstand voltage	(AC external batch relay-drive power supply. 5V internal circuit) 2830VAC rms/3 cycle (2,000m (6557,38ft)) (Relay-drive power supply, 5V internal circuit) 500VAC rms/3 cycle (2,000m (6557,38ft))	2830VAC rms/3 cycle (altitude 2,000m (6557,38ft))	○	
Insulation resistance	10MΩ or more by insulation resistance tester	10MΩ or more by insulation resistance tester	○	
Noise durability	IEC801-4 : 1kV	By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency First transient noise IEC61000-4-4: 1kV	○	
Current consumption	0.15A (TYP. all points ON)	0.43A (TYP. all points ON)	△	Review current capacity since current consumption is increased.
External dimensions	250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D)inch)	△	Wiring space is narrow.
Weight	0.50kg	0.22kg	○	

(13)Specifications comparison between AY22 and QY22

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY22	QY22	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		100-240VAC 50/60Hz ±5%	100-240VAC 50/60Hz ±5%	○	
Maximum load voltage		264VAC	264VAC	○	
Maximum load current		2A/point,3.3A/common	0.6A/point, 4.8A/common	△	Carefully select load for use since the maximum load current per point is lowered.
Minimum load voltage current		24VAC 100mA 100VAC 10mA 240VAC 20mA	24VAC 100mA 100VAC 25mA 240VAC 25mA	△	Carefully select load for use since the minimum load current is increased.
Maximum inrush current		40A 10ms or less 15A 100ms or less	20A 1 cycle or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		1.5mA (120VAC 60Hz) 3mA (240VAC 60Hz)	1.5mA or less (For 120VAC 60Hz) 3mA or less (For 240VAC 60Hz)	○	
Maximum voltage drop at ON		1.5VAC or less (1 to 2A) 1.8VAC or less (0.2 to 1A) 5VAC or less (0.2A or less)	1.5V or less	○	
Response time	OFF to ON	1ms or less	1ms + 0.5 cycles or less	○	
	ON to OFF	1ms + 0.5 cycles or less	1ms + 0.5 cycles or less (Rated load, resistance load)	○	
Surge suppressor		CR absorber (0.022μF+47Ω) Varistor (387 to 473V)	CR absorber	△	Varistors are not built in. *1
Common terminal arrangement		8 points/common (Common terminal : TB9, TB18)	16 points/common (Common terminal : TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		7A fast blow fuse (1 fuse/common) type HP-70K	None (Installing a fuse to an external cable is recommended.)	×	Fuses are not built in. *2
Fuse blow indicator		Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	–	×	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.305A (TYP. all points ON)	0.25A (Max. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 112.3 (D) mm (3.86 (H) × 1.08 (W) × 4.42 (D) inch)	△	Wiring space is narrow.
Weight		0.71kg	0.40kg	○	

*1 Connect a varistor to reduce external noise.

*2 Mount a fuse on every external terminal to prevent the external device and module deterioration upon load short circuit. Also, configure an external circuit when displaying fuse blown is required.

(14)Specifications comparison between AY23 and QY22

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY23	QY22	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY22s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		100-240VAC 40 to 70Hz	100-240VAC 50/60Hz ±5%	○	
Maximum load voltage		264VAC	264VAC	○	
Maximum load current		0.6A/point,2.4A/common (When placing next to the power supply module: 1.05A/common)	0.6A/point, 4.8A/common	○	
Minimum load voltage current		24VAC 100mA 100VAC 10mA 240VAC 10mA	24VAC 100mA 100VAC 25mA 240VAC 25mA	△	Carefully select load for use since the minimum load current is increased.
Maximum inrush current		20A 10ms or less 8A 100ms or less	20A 1 cycle or less	○	
Leakage current (OFF)		1.5mA (120VAC 60Hz) 3mA (240VAC 60Hz)	1.5mA or less (for 120VAC 60Hz) 3mA or less (for 240VAC 60Hz)	○	
Maximum voltage drop at ON		1.5VAC or less (100 to 600mA) 1.8VAC or less (50 to 100mA) 2VAC or less (10 to 50mA)	1.5V or less	○	
Response time	OFF to ON	1ms or less	1ms + 0.5 cycles or less	○	
	ON to OFF	1ms + 0.5 cycles or less	1ms + 0.5 cycles or less (rated load, resistance load)	○	
Surge suppressor		CR absorber ($0.022\mu F + 47\Omega$)	CR absorber	○	
Common terminal arrangement		8 points/common (Common terminal : TB9, TB18, TB27, TB36)	16 points/common (Common terminal : TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		3.2A fast blow fuse (1 fuse/common) type HP-32	None	×	Fuses are not built in. *1
Fuse blow indicator		Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	–	×	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to $2mm^2$	0.3 to $0.75mm^2$ core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.59A (TYP. all points ON)	0.25A (Max. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 112.3 (D) mm (3.86 (H) × 1.08 (W) × 4.42(D) inch)	△	Wiring space is narrow.
Weight		0.55kg	0.40kg	○	

*1 Mount a fuse on every external terminal to prevent the external device and module deterioration upon load short circuit. Also, configure an external circuit when displaying fuse blown is required.

(15)Specifications comparison between AY40 and QY40P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY40	QY40P	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2-40VDC	10.2-28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point,0.8A/common	0.1A/point, 1.6A/common	○	
Maximum inrush current		0.4A	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20TB10, TB20)	16 points/common (Common terminal: TB18)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		None	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8V) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	8mA (24VDC TYP. /common)	10mA (at 24VDC) (Max. all points ON)	○	
Current consumption		0.115A (TYP. all points ON)	0.065A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.16kg	○	

(16)Specifications comparison between AY40P and QY40P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY40P	QY40P	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2-26.4VDC	10.2-28.8VDC	○	
Maximum load current		0.1A/point, 0.8A/common	0.1A/point, 1.6A/common	○	
Maximum inrush current		0.38A 5ms or less	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC(0.1A) 1.75VDC(5mA) 1.7VDC(1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10,TB20)	16 points/common (Common terminal: TB18)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point.	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.8 to 26.4VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	○	
	Current	15mA (24VDC TYP. /common)	10mA (at 24VDC) (Max. all points ON)	○	

(17)Specifications comparison between AY40A and QY68A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY40A	QY68A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY68As when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	5-24VDC	○	
Operating load voltage range		10.2 to 30VDC (Max. applied voltage)	4.5 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.3A/point	2A/point, 8A/unit	○	
Maximum inrush current		1A 100ms or less	8A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (50mA to 0.3A) 1.0VDC (50mA or less)	0.3VDC (Max.) 2A	○	
Response time	OFF to ON	2ms or less	3ms or less	△	Response time differs.
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	△	
Surge suppressor		Surge suppression diode	Zener diode	○	
Common terminal arrangement		Not provided (All points independent)	Not provided (All points independent)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.19A (TYP. all points ON)	0.11A (TYP. all points ON)	△	Review current capacity when using two QY68As since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.42kg	0.14kg	○	

(18)Specifications comparison between AY41 and QY41P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY41	QY41P	Compat-ibility	Precautions for replacement
Number of output points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 28.8VDC	△	Reviewing power supply capacity is required.
Maximum load current		0.1A/point 1.6A/common	0.1A/point 2A/common	△	Pay attention to the common current.
Maximum inrush current		0.4A	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36)	32 points/common (Common terminal: A01, A02)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		–	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40-pin connector (Option)	×	Wiring change is required.*1
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	20mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.105A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(19)Specifications comparison between AY41P and QY41P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY41P	QY41P	Compat-ibility	Precautions for replacement
Number of output points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.8-26.4VDC	10.2 to 28.8VDC	○	
Maximum load current		0.1A/point 1.0A/common	0.1A/point 2A/common	○	
Maximum inrush current		0.38A 5ms or less	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18, TB36)	32 points/common (Common terminal: A01, A02)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		Yes (overheat protection function, overload protection function) Overheat protection function is activated in increments of 8 points.	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40-pin connector (Option)	×	Wiring change is required.*1
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
External power supply	Voltage	12/24VDC (10.8 to 26.4VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	○	
	Current	30mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.105A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(20)Specifications comparison between AY41-UL and QY41P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY41-UL	QY41P	Compat-ibility	Precautions for replacement
Number of output points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point 1.6A/common	0.1A/point 2A/common	△	Pay attention to the common current.
Maximum inrush current		0.4A	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36)	32 points/common (Common terminal: A01, A02)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40-pin connector (Option)	×	Wiring change is required.*1
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	–	×	
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	20mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.105A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.15kg	○	

*1 By using connectors/terminal block converter modules (A6TBXY36, etc.) conversion to the terminal block is possible.

(21)Specifications comparison between AY42 and QY42P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY42	QY42P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point, 2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.7A, 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistance load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (Common terminal: 1A1, 1A2, 2A1, 2A2)	32 points/common (Common terminal: 1A01, 1A02, 2A01, 2A02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
Protection		–	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		Two 40-pin connectors (Solder)	Two 40-pin connectors (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		$0.3mm^2$	$0.3mm^2$ (For A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	–	×	The 40 pin connectors are sold separately. Purchase them separately.
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	40mA (24VDC TYP. /common)	20mA (at 24VDC)/common	○	
Current consumption		0.34A (TYP. all points ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.50kg	0.17kg	○	

(22)Specifications comparison between AY42-S1 and QY42P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY42-S1	QY42P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point,2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.7A, 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	0.1ms or less	1ms or less	△	Response time differs.
	ON to OFF	0.3ms or less (Resistive load)	1ms or less (Rated load, resistive load)	△	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (Common terminal: 1A1, 1A2, 2A1, 2A2)	32 points/common (Common terminal: 1A01, 1A02, 2A01, 2A02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
Protection		–	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		Two 40-pin connectors (Solder)	Two 40-pin connectors (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		$0.3mm^2$	$0.3mm^2$ (for A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	–	×	The 40 pin connectors are sold separately. Purchase them separately.
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	40mA (24VDC TYP. /common)	20mA (at 24VDC)/common	○	
Current consumption		0.29A (TYP. all points ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.50kg	0.17kg	○	

(23)Specifications comparison between AY42-S3 and QY42P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY42-S3	QY42P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point,2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A/point 3.5A/fuse	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (Common terminal: 1A1, 1A2, 2A1, 2A2)	32 points/common (Common terminal: 1A01, 1A02, 2A01, 2A02)	○	
Operation indication		1.6A normal fuse (2 fuses/common)	None	△	The fuse-equivalent short circuit protection function is incorporated.
Protection		–	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
Fuse		Yes	–	×	Fuse blown is not displayed since the QY42P does not have fuses.
Fuse blow indicator		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		Two 40-pin connectors (Solder)	Two 40-pin connectors (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		$0.3mm^2$	$0.3mm^2$ (for A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	–	×	The 40 pin connectors are sold separately. Purchase separately.
External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	40mA (24VDC TYP. /common)	20mA (at 24VDC)/common	○	
Current consumption		0.29A (TYP. all points ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.50kg	0.17kg	○	

(24)Specifications comparison between AY42-S4 and QY42P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY42-S4	QY42P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.1A/point, 1.92A/common	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A 10ms or less	0.7A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.0VDC (TYP.) 0.1A 2.5VDC (Max.) 0.1A	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Zener diode build-in photocoupler	Zener diode	○	
Common terminal arrangement		32 points/common (Common terminal: 1A1, 1A2, 2A1, 2A2)	32 points/common (Common terminal: 1A01, 1A02, 2A01, 2A02)	○	
Operation indication		ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
Protection		–	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	○	
External connection method		Two 40-pin connectors (Solder)	Two 40-pin connectors (Option)	○	The 40 pin connectors are sold separately. Purchase them separately.
Applicable wire size		$0.3mm^2$	$0.3mm^2$ (for A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	–	×	The 40 pin connectors are sold separately. Purchase them separately.
External power supply	Voltage	–	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	×	External power supply is required.
	Current	–	20mA (at 24VDC)/common	×	
Current consumption		0.50A (TYP.60% or less simultaneous ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.17kg	○	

(25)Specifications comparison between AY50 and QY50

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY50	QY50	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.5A/point, 2A/common	0.5A/point, 4A/common	○	
Maximum inrush current		7A 10ms or less 3.5A 100ms or less	4A 10ms or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (Max.) 0.5A	0.2VDC (TYP.) 0.5A 0.3VDC (Max.) 0.5A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20)	16 points/common (Common terminal: TB18)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		2A fast blow fuse (1 fuse common) type	6.7A (Unchangeable) (Fuse blow capacity: 50A)	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	Yes (When fuse blows, LED indicates it and signal is output to CPU.)	△	The QY50 does not detect fuse blown unless the external power is supplied.
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	65mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.115A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.42kg	0.17kg	○	

(26)Specifications comparison between AY51 and QY50

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY51	QY50	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY50s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3.3A/common)	0.5A/point, 4A/common	○	
Maximum inrush current		4A 10ms or less	4A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (Max.) 0.5A	0.2VDC (TYP.) 0.5A 0.3VDC (Max.) 0.5A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36)	16 points/common (Common terminal: TB18)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		None	6.7A (Unchangeable) (Fuse blow capacity: 50A)	○	
Fuse blow indicator		–	Yes (When fuse blows, LED indicates it and signal is output to CPU.)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	50mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.53kg	0.17kg	○	

(27)Specifications comparison between AY51-S1 and QY50

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY51-S1	QY50	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY50s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.3A/point, 2A/common (1A fuse common)	0.5A/point, 4A/common	○	
Maximum inrush current		3A 10ms or less	4A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1VDC (TYP.) 0.3A 1.5VDC (Max.) 0.3A	0.2VDC (TYP.) 0.5A 0.3VDC (Max.) 0.5A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Transistor built-in zener diode	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36) 8 points/fuse common	16 points/common (Common terminal: TB18)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		1A fast blow fuse (2 fuses per common in units of 8 points) MP-10	6.7A (Unchangeable) (Fuse blow capacity: 50A)	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	Yes (When fuse blows, LED indicates it and signal is output to CPU.)	△	The QY50 does not detect fuse blown unless the external power is supplied.
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	100mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.31A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.55kg	0.17kg	○	

(28)Specifications comparison between AY51-UL and QY50

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY51-UL	QY50	Compat-ibility	Precautions for replacement
Number of output points		32 points	16 points	△	Use two QY50s when using 17 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3.3A/common)	0.5A/point, 4A/common	○	
Maximum inrush current		0.4A 10ms or less	4A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (Max.) 0.5A	0.2VDC (TYP.) 0.5A 0.3VDC (Max.) 0.5A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36)	16 points/common (Common terminal: TB18)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		None	6.7A (Unchangeable) (Fuse blow capacity: 50A)	○	
Fuse blow indicator		–	Yes (When fuse blows, LED indicates it and signal is output to CPU.)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8 VDC is not applicable.
	Current	50mA (24VDC TYP. /common)	20mA (at 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.53kg	0.17kg	○	

(29)Specifications comparison between AY60 and QY68A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY60	QY68A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY68s when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		24VDC (12/48V)	5-24VDC	△	Voltage over 28.8 VDC is not applicable.
Operating load voltage range		21.6 to 26.4VDC (10.2 to 56VDC)	4.5 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		2A/point,5A/common (3A/fuse) (When placing next to the power supply module: 3A/common)	2A/point, 8A/module	△	Since the maximum load current per common is different, pay attention to the current used in the entire module.
Maximum inrush current		4A 100ms or less, 8A 10ms or less	8A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (2A)	0.3VDC (Max.) 2A	○	
Response time	OFF to ON	2ms or less	3ms or less	△	Response time differs.
	ON to OFF	2ms or less (Resistive load)	10ms or less (Resistive load)	△	
Surge suppressor		Varistor (108 to 132V)	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20)	Not provided (All points independent)	△	The wiring of terminal block differs since all the contacts of the QY68A are independent.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		3.2A fast blow fuse (2 fuses/common) type MP-32	None (Installing a fuse to an external cable is recommended.)	×	Fuses are not built in. *1
Fuse blow indicator		Yes (When fuse blows, LED indicates it and signal is output to CPU.)	–	×	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
External power supply	Voltage	24VDC (21.6 to 26.4VDC)	–	○	External power supply is not required.
	Current	65mA (24VDC TYP. /common)	–	○	
Current consumption		0.115A (TYP. all points ON)	0.11A (TYP. all points ON)	○	Review current capacity when using two QY68s since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.64kg	0.14kg	○	

*1 Mount a fuse on every external terminal to prevent the external device and module deterioration upon load short circuit. Also, configure an external circuit when displaying fuse blown is required.

(30)Specifications comparison between AY60E and QY68A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY60E	QY68A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY68s when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		24VDC (12/48V)	5-24VDC	△	Voltage over 28.8 VDC is not applicable.
Operating load voltage range		21.6 to 26.4VDC (10.2 to 56VDC)	4.5 to 28.8VDC	△	Voltage over 28.8 VDC is not applicable.
Maximum load current		12/24VDC 2A/points 48VDC 0.8A/points 5A/common (When placing next to the power supply module: 3A/common)	2A/points 8A/unit	△	Since the maximum load current per common is different, pay attention to the current used in the entire module.
Maximum inrush current		4A 100ms or less 8A 10ms or less	8A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (2A)	0.3VDC (Max.) 2A	○	
Response time	OFF to ON	2ms or less	3ms or less	△	Response time differs.
	ON to OFF	2ms or less (Resistive load)	10ms or less (Resistive load)	△	
Surge suppressor		Surge suppression diode	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20)	Not provided (All points independent)	△	The wiring of terminal block differs since all the contacts of the QY68A are independent.
Fuse		5A fast blow fuse (2 fuses/common) type	None (Installing a fuse to an external cable is recommended.)	×	Fuses are not built in. *1
Fuse blow indicator		Yes (When fuse is blows, LED indicates it signal is output to CPU.)	–	×	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3 RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.115A (TYP. all points ON)	0.11A (TYP. all points ON)	△	Review current capacity when using two QX28s since current consumption is increased in that use.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.63kg	0.14kg	○	

*1 Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit. Also, configure an external circuit when fuse blown display is necessary.

(31)Specifications comparison between AY60S and QY68A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY60S	QY68A	Compat-ibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	△	Use two QY68As when using 9 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		24/48VDC (12V)	5-24VDC	△	Voltage over 28.8VDC is not applicable.
Operating load voltage range		21.6 to 52.8VDC (10.2 to 52.8VDC)	4.5 to 28.8VDC	△	Voltage over 28.8VDC is not applicable.
Maximum load current		2A/points,6.4A/common (5A/ fuse) (When placing next to the power supply module: 5A/common)	2A/points, 8A/unit	○	
Maximum inrush current		4A 100ms or less, 8A 10ms or less	8A 10ms or less	○	
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1VDC (2A)	0.3VDC (Max.) 2A	○	
Response time	OFF to ON	1ms or less	3ms or less	△	Response time differs.
	ON to OFF	3ms or less (Resistive load)	10ms or less (Resistive load)	△	
Surge suppressor		Varistor (90 to 110V)	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20)	Not provided (All points independent)	△	The wiring of terminal block differs since all the contacts of the QY68A are independent.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		5A fast blow fuse (2 fuses/common) type MP-50	None (Installing a fuse to an external cable is recommended.)	×	Fuses are not built in. *1
Fuse blow indicator		Yes (When fuse is blows, LED indicates it signal is output to CPU.)	–	×	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Current consumption		0.075A (TYP. all points ON)	0.11A (TYP. all points ON)	○	Review current capacity since current consumption is increased.
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76(D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.66kg	0.14kg	○	

*1 Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit. Also, configure an external circuit when fuse blown display is necessary.

(32)Specifications comparison between AY70 and QY70

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY70	QY70	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5-12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point 128mA/common	16mA/point 256mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms of less	△	Carefully select load for use since the inrush current value differs.
Output voltage at OFF		VOH: 3.5VDC (Vcc = 5VDC, IOH = 0.4mA)	VOH: 3.5VDC (Vcc = 5VDC, IOH = 0.4mA)	○	
Maximum voltage drop at ON		VOL: 0.2VDC (IOL: 16mA)	VOL: 0.3VDC	△	Check the input specification of an external equipment to be connected since the maximum voltage drop is bigger when turning on.
Response time	OFF to ON	1ms or less	0.5ms or less	○	
	ON to OFF	1ms or less	0.5ms or less (Resistive load)	○	
Common terminal arrangement		8 points/common (Common terminal: TB10, TB20)	16 points/common (Common terminal: TB18)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (Unchangeable) (Fuse blow capacity: 50A)	○	
Fuse blow indicator		–	Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
External power supply	Voltage	5/12VDC (4.5 to 15VDC)	5-12VDC (4.5 to 15VDC) (Ripple ratio within 5%)	○	
	Current	55mA (12VDC TYP. /common)	90mA (at 12VDC) (Max. all points ON)	○	
Current consumption		0.10A (TYP. all points ON)	0.095A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84(H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.36kg	0.14kg	○	

(33)Specifications comparison between AY71 and QY71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY71	QY71	Compat-ibility	Precautions for replacement
Number of output points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5-12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point 256mA/common (Sink loading)	16mA/point 512mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms or less	△	Carefully select load for use since the inrush current value differs.
Output voltage at OFF		V_{OH}: 3.5VDC (V_{CC} = 5VDC, I_{OH} = 0.4mA)	V_{OH}: 3.5VDC (V_{CC} = 5VDC, I_{OH} = 0.4mA)	○	
Maximum voltage drop at ON		V_{OL}: 0.2VDC (I_{OL}: 16mA)	V_{OL}: 0.3VDC	△	Check the input specifications of an external equipment to be connected since the maximum voltage drop is bigger when turning on.
Response time	OFF to ON	1ms or less	0.5ms or less	○	
	ON to OFF	1ms or less	0.5ms or less (Resistive load)	○	
Common terminal arrangement		16 points/common (Common terminal: TB18,TB36)	32 points/common (Common terminal: A01, A02)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (Unchangeable) (Fuse blow capacity: 50A)	○	
Fuse blow indicator		–	Yes (When fuse is blows, LED indicates it signal is output to CPU.)	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	40-pin connector (Option)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1 or A6CON4)	×	
External power supply	Voltage	5/12VDC (4.5 to 15VDC)	5-12VDC (4.5 to 15VDC) (Ripple ratio within 5%)	○	
	Current	100mA (12VDC TYP. /common)	170mA (at 12VDC) (Max. all points ON)	○	
Current consumption		0.20A (TYP. all points ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D)mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.44kg	0.14kg	○	

(34)Specifications comparison between AY72 and QY71

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY72	QY71	Compat-ibility	Precautions for replacement
Number of output points		64 points	32 points	△	Use two QY71s when using 33 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5-12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point, 512mA/common (Sink loading)	16mA/point, 512mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms or less	△	Carefully select load for use since the inrush current value differs.
Output voltage at OFF		VOH: 3.5VDC (Vcc = 5VDC, IOH = 0.4mA)	VOH: 3.5VDC (Vcc=5VDC, IOH=0.4mA)	○	
Maximum voltage drop at ON		VOL: 0.2VDC (IOL = 16mA)	VOL: 0.3VDC	△	Check the input specifications of an external equipment to be connected since the maximum voltage drop is bigger when turning on.
Response time	OFF to ON	1ms or less	0.5ms or less	○	
	ON to OFF	1ms or less	0.5ms or less (resistive load)	○	
Common terminal arrangement		32 points/common (Common terminal: 1A1, 1A2, 2A1, 2A2)	32 points/common (Common terminal: A01, A02)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (Unchangeable) (Fuse blow capacity: 50A)	○	
Fuse blow indicator		–	Yes (When fuse is blows, LED indicates it signal is output to CPU.)	○	
External connection method		Two 40-pin connectors (Solder)	40-pin connector (Option)	○	The 40 pin connector is sold separately. • 32 points or less: 1pcs. • 33 points or more: 2pcs.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Accessory		Two external wiring connectors	None	×	The 40 pin connector is sold separately. • 32 points or less: 1pcs. • 33 points or more: 2pcs.
External power supply	Voltage	5/12VDC (4.5 to 15VDC)	5-12VDC (4.5 to 15VDC) (Ripple ratio within 5%)	○	
	Current	300mA (12VDC TYP. 1 common ON)	170mA (at 12VDC) (Max. all points ON)	○	
Current consumption		0.30A (TYP. all points ON)	0.15A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17(D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.47kg	0.14kg	○	

(35)Specifications comparison between AY80 and QY80

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY80	QY80	Compat-ibility	Precautions for replacement
Number of output points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8VDC is not applicable.
Maximum load current		0.5A/point, 2A/common	0.5A/point, 4A/common	○	
Maximum inrush current		7A 10ms or less 3.5A 100ms or less	4A 10ms or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (Max.) 0.5A	0.2VDC (TYP.) 0.5A 0.3VDC (Max.) 0.5A	○	
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		8 points/common (Common terminal: TB9,TB19)	16 points/common (Common terminal: TB17)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Operation indication		ON indication (LED)	ON indication (LED)	○	
Fuse		2A fast blow fuse (1 fuse/common) type	6.7A (Unchangeable) (Fuse blow capacity: 50A)	△	When necessary, connect a fuse externally.
Fuse blow indicator		Yes (When fuse is blows, LED indicates it's signal is output to CPU.)	Yes (When fuse is blows, LED indicates it's signal is output to CPU.)	△	The QY80 does not detect fuse blown without external power supply.
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8VDC is not applicable.
	Current	60mA (24VDC TYP. 1 common ON)	20mA (at 24VDC)	○	
Current consumption		0.115A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76(D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H)× 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.42kg	0.17kg	○	

(36)Specifications comparison between AY81 and QY81P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY81	QY81P	Compat-ibility	Precautions for replacement
Number of output points		32 points	32 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 28.8VDC	△	Voltage over 28.8VDC is not applicable.
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3A/common)	0.1A/point, 2A/common	△	Carefully select load for use since the maximum load current per point is lowered.
Maximum inrush current		4A 10ms or less	0.7A 10ms or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (Max.) 0.5A	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	△	Because different values for maximum voltage drop are given, care should be taken to select loads to be used.
Response time	OFF to ON	2ms or less	1ms or less	○	
	ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
Common terminal arrangement		16 points/common (Common terminal: TB17, TB35)	32 points/common (Common terminal: 17, 18, 36)	△	As the common changes from two commons to one common, wiring with a different voltage for each common is not possible.
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		None	Yes (Overheat protection function, overload protection function.) • Overheat protection function is activated in units of 2 points. • Overload protection function is activated in units of 1 point.	○	
External connection method		38-point terminal block connector (M3 × 6 screws)	37-pin D-subconnector (Option)	×	Wiring change is required. *1
Applicable wire size		0.75 to 2mm^2	0.3mm^2 (For A6CON1E)	×	
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8VDC is not applicable.
	Current	50mA (24VDC TYP. 1 common ON)	40mA (At 24VDC)	○	
Current consumption		0.23A (TYP. all points ON)	0.095A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 131 (D) mm (9.84 (H) × 1.48 (W) × 5.16 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.53kg	0.15kg	○	

*1 By using connectors/terminal block converter modules (A6TBY36-E, etc.) conversion to the terminal block is possible.

(37)Specifications comparison between AY82-EP and QY81P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY82-EP	QY81P	Compat-ibility	Precautions for replacement
Number of output points		64 points	32 points	△	Use two QY81Ps when using 33 points or more.
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 26.4VDC	10.2 to 28.8VDC	○	
Maximum load current		0.1A/point 0.04A/point (60%ON, 55 °C)	0.1A/point, 2A/common	○	
Maximum inrush current		No limit (Short protect function)	0.7A 10ms or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		3.5VDC (0.1A) 2.5VDC (0.1A TYP.)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	0.5ms or less	1ms or less	△	Response time differs.
	ON to OFF	1.5ms or less	1ms or less (Rated load, resistive load)	△	
Common terminal arrangement		32 points/common (Common terminal: 1-17, 1-18, 1-36, 2-17, 2-18, 2-36)	32 points/common (Common terminal: 17, 18, 36)	○	
Surge suppressor		Surge suppression diode	Zener diode	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		Yes (Overheat protection function, and short-circuit protection function.) • Overheat protection func. is detected in 1 point unit. When Overheat protection func. occurs at an 1 point of 1 common, output of all points for corresponded common terminal is turned. OFF.	Yes (Overheat protection function, overload protection function.) • Overheat protection function is activated in units of 2 points. • Overload protection function is activated in units of 1 point.	○	
Protection detection display		None (No signal output to programmable controller CPU.)	None (No signal output to programmable controller CPU.)	○	
Protection reset method		Automatic reset (Reset by canceling Overheat protection func.)	Automatic reset (Reset by canceling Overheat protection func.)	○	
External connection method		Two 37-pin connectors (Solder)	37-pin D-subconnector (Option)	○	The 37 pin connector is sold separately. • 32 points or less: 1pcs. • 33 points or more: 2pcs.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1E)	○	
Accessory		Two external wiring connectors	None	×	The 37 pin connector is sold separately. • 32 points or less: 1pcs. • 33 points or more: 2pcs.
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage of 28.8VDC or more is not allowed.
	Current	50mA (24VDC TYP. 1 common ON)	40mA (at 24VDC)	○	
Current consumption		0.29A (TYP. all points ON)	0.095A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.58kg	0.15kg	○	

(38)Specifications comparison between AY82-EP and QY82P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY82-EP	QY82P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12-24VDC	○	
Operating load voltage range		10.2 to 26.4VDC	10.2 to 28.8VDC	○	
Maximum load current		0.1A/point 0.04A/point (60%ON, 55 °C)	0.1A/point, 2A/common	○	
Maximum inrush current		No limit (Short protect function)	0.7A 10ms or less	△	Carefully select load for use since the inrush current value differs.
Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		3.5VDC (0.1A) 2.5VDC (0.1A TYP.)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Response time	OFF to ON	0.5ms or less	1ms or less	△	Response time differs.
	ON to OFF	1.5ms or less	1ms or less (Rated load, resistive load)	△	
Common terminal arrangement		32 points/common (Common terminal: 1-17, 1-18, 1-36, 2-17, 2-18, 2-36)	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	×	Wiring change is required
Surge suppressor		Surge suppression diode	Zener diode	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
Protection		Yes (Overheat protection function, and short-circuit protection function.) • Overheat protection func. is detected in 1 point unit. When Overheat protection func. occurs at an 1 point of 1 common, output of all points for corresponded common terminal is turned. OFF.	Yes (Overheat protection function, overload protection function.) • Overheat protection function is activated in units of 2 points. • Overload protection function is activated in units of 1 point.	○	
External connection method		Two 37-pin connectors (Solder)	37-pin D-subconnector (Option)	○	The 37 pin connector is sold separately. 32 points or less: 1pcs. 33 points or more: 2pcs.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1E)	○	
Accessory		Two external wiring connectors	None	×	The 37 pin connector is sold separately. 32 points or less: 1pcs. 33 points or more: 2pcs.
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8VDC is not applicable.
	Current	50mA (24VDC TYP. 1 common ON)	40mA (at 24VDC)/common	○	
Current consumption		0.29A (TYP. all points ON)	0.095A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 106 (D) mm (9.84 (H) × 1.48 (W) × 4.17 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.58kg	0.15kg	○	

3.2.3 Combined I/O module specifications comparison

(1) Specifications comparison between AH42 and QH42P

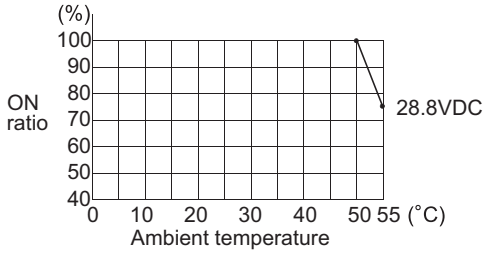
○: Compatible, △: Partial change required, ×: Incompatible

Specification			AH42	QH42P	Compat-ibility	Precautions for replacement
Input specifications	Number of input points		32 points	32 points	○	
	Insulation method		Photocoupler	Photocoupler	○	
	Input type		Sink type	Sink type (Positive common)	○	
	Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.
	Rated input current		Approx. 3mA (at 12VDC)/ Approx. 7mA (at 24VDC)	Approx. 4mA	△	Reduced. *1
	Maximum number of simultaneous input points		60% Simultaneously ON	Refer to the derating chart. *2	○	
	ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC are not applicable.
	OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.
	Input resistance		Approx. 3.3kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *1
	Response time	OFF to ON	10ms or less (24VDC)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
		ON to OFF	10ms or less (24VDC)	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	Common terminal arrangement		32 points/common (Common terminal: 1B1,1B2)	32 points/common (Common terminal: 1B01, 1B02)	○	
Output specifications	Number of output points		32 points	32 points	○	Output number (Y ☐) differs. *3
	Insulation method		Photocoupler	Photocoupler	○	
	Output type		Sink type	Sink type	○	
	Rated load voltage		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltage over 28.8VDC is not applicable.
	Maximum load current		0.1A/1point, 1A/common	0.1A/1 point, 2A/common	○	
	Max. inrush current		0.4A 10ms or less	0.7A 10ms or less	○	
	Leakage current (OFF)		0.1mA or less	0.1mA or less	○	
	Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
	Response time	OFF to ON	2ms or less	1ms or less	○	
		ON to OFF	2ms or less (Resistive load)	1ms or less (Rated load, resistive load)	○	
	Surge suppressor		Clamp diode	Zener diode	○	
	Common terminal arrangement		32 points/common (Common terminal: 2A1, 2A2)	32 points/common (Common terminal: 2A01, 2A02)	○	
	External power supply	Voltage	12/24VDC (10.2 to 40VDC)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	△	Voltage over 28.8VDC is not applicable.
		Current	0.04A (24VDC TYP.)	0.015A (24VDC)/common (Max. all points ON)	○	The 40 pin connectors are sold separately. Purchase separately.
Operation indication			ON indication (LED) 32 point switch-over using switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method			40 pin connector × 2	40 pin connector × 2 (Option)	○	The 40 pin connectors are sold separately. Purchase separately.
Applicable wire size			0.3mm ^{2}	0.3mm^2 (For A6CON1 or A6CON4)	○	
Accessory			40 pin connector × 2 (Soldering type)	None	×	The two 40 pin connectors are sold separately. Purchase separately.
Number of occupied points			64 points (I/O assignment: output 64 points)	32 points (I/O assignment: input/output composite)	×	Output number (Y ☐) differs. *3
Current consumption			0.25A (TYP. all points ON)	0.13A (TYP. all points ON)	○	

Specification	AH42	QH42P	Compat-ibility	Precautions for replacement
External dimensions	250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight	0.70kg	0.20kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QH42P.

*2 The following shows the derating chart.



*3 Modify the output number used in the program. (Review the programs)

(2) Specifications comparison between AH42 and QX41Y41P

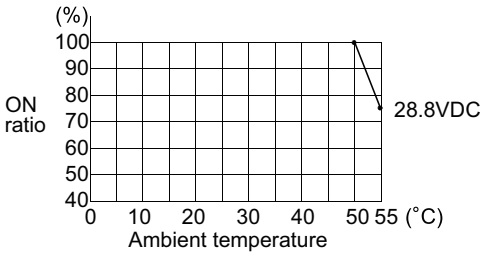
○: Compatible, △: Partial change required, ×: Incompatible

Specifications			AH42	QX41Y41P	Compat-ibility	Precautions for replacement
Input specifications	Number of input points		32 points	32 points	○	
	Insulation method		Photocoupler	Photocoupler	○	
	Input format		Sink type	Positive common type	○	
	Operating voltage range		10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC cannot be used.
	Rated input current		Approx.3mA (at 12VDC)/ Approx.7mA (at 24VDC)	Approx.4mA	△	Rated input current is smaller. *1
	Maximum number of simultaneous input points		60% simultaneously ON	Refer to the derating chart. *3	○	
	ON voltage/ON current		9.5VDC or more/3mA or more	19VDC or more/3mA or more	△	12VDC cannot be used.
	OFF voltage/OFF current		6VDC or less/1.5mA or less	11VDC or less/1.7mA or less	△	12VDC cannot be used.
	Input resistance		Approx.3.3kΩ	Approx.5.6kΩ	△	Input resistance is greater. *2
	Response time	OFF→ON	10ms or less (24VDC)	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) Initial setting is 10ms.	○	Input response time of the parameter must be used at the initial value (10ms).
		ON→OFF	10ms or less (24VDC)	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) Initial setting is 10ms.	○	Input response time of the parameter must be used at the initial value (10ms).
	Common terminal arrangement		32 points/common (Common terminal: 1B1,1B2)	32 points/common (Common terminal: 1B01,1B02)	○	
Output specifications	Number of output points		32 points	32 points	○	
	Insulation method		Photocoupler	Photocoupler	○	
	Output format		Sink type	Sink type	○	
	Rated load voltage		10.2 to 40VDC	10.2 to 28.8VDC	△	Voltages exceeding 28.8VDC cannot be applied.
	Maximum load current		0.1A/point, 1A/common	0.1A/point, 2A/common	○	
	Maximum inrush current		0.4A 10ms or less	0.7A 10ms or less	○	
	Leakage current at OFF		0.1mA or less	0.1mA or less	○	
	Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
	Response time	OFF→ON	2ms or less	1ms or less	○	
		ON→OFF	2ms or less (Resistance load)	1ms or less (Rated load, Resistance load)	○	
	Surge suppressor		Clamp diode	Zener diode	○	
	Common terminal arrangement		32 points/common (Common terminal: 2A1, 2A2)	32 points/common (Common terminal: 2A01, 2A02)	○	
	External power supply	voltage	12/24VDC (10.2 to 40VDC)	12 to 24VDC (+20/-15%) (Ripple ratio within 5%)	△	Voltages exceeding 28.8VDC cannot be applied.
		current	0.04A (24VDC TYP.)	Max.0.015A/common (24VDC, when all points are ON)	○	
Operation indication			ON indication (LED) 32-point switching indication with SW	ON indication (LED) 32-point switching indication with SW	○	
External connection method			40-pin connector × 2	40-pin connector × 2 (sold separately)	○	Since 40-pin connector is sold separately, purchase two of them.
Applicable wire size			0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
Accessory			40-pin connector × 2 (soldering type)	(None)	×	Since 40-pin connector is sold separately, purchase two of them.
Number of occupied points			64 points (I/O assignment: Output 64 points)	64 points (I/O assignment: I/O mix 64 points)	○	
Current consumption			0.25A (TYP.all points ON)	0.13A (TYP.all points ON)	○	
External dimensions			250(H) × 37.5(W) × 121(D) mm (9.84(H) × 1.48(W) × 4.76(D) inch)	98(H) × 27.4(W) × 90(D) mm (3.86(H) × 1.08(W) × 3.54(D) inch)	△	
Weight			0.70kg	0.20kg	○	

*1 Use the QX71 at 12VDC.

*2 Check the specifications of the sensor or switches to be connected to the QX41Y41P.

*3 The following shows the derating chart.



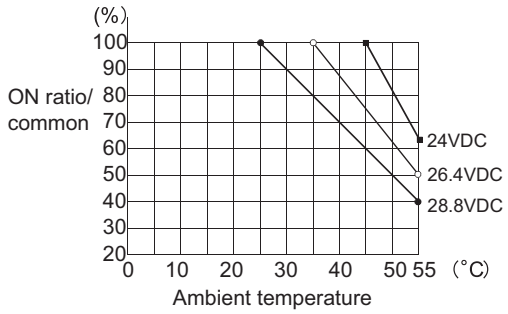
(3) Specifications comparison between A42XY and QX42/QY42P

(a) Specifications comparison between A42XY (input part) and QX42

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A42XY (input specification)	QX42	Compat-ibility	Precautions for replacement
Number of input points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
input type		Dynamic scan of 8 inputs × 8	Static	×	Set the static.
Rated input voltage		12/24VDC (10.2 to 26.4VDC) (Ripple ratio within 5%)	24VDC (20.4 to 28.8VDC) (Ripple ratio within 5%)	○	
Maximum number of simultaneous input points		60% Simultaneously ON	Refer to the derating chart. *2	△	Use within the range shown in the derating figure.
ON voltage/ON current		7VDC or more	19VDC or more/3mA or more	△	12VDC are not applicable.
OFF voltage/OFF current		3VDC or more	11VDC or less/1.7mA or less	△	12VDC are not applicable.
Input resistance		Approx. 2.4kΩ	Approx. 5.6kΩ	△	Input resistance has increased. *2
Response time	OFF to ON	16ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
	ON to OFF	16ms or less	1ms/5ms/10ms/20ms /70ms or less (CPU parameter setting) initial setting is 10ms	○	Use initial value (10ms) for the input response time of parameters.
Common terminal arrangement		–	32 points/common (Common terminal: 1B01, 1B02, 2B01, 2B02)	–	
Operation indication		ON indication (LED) Batch of 8 inputs selected by rotary switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		input: 16 pin connector	40 pin connector	×	Wiring change is required.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
External power supply	Voltage	12/24VDC (10.2 to 26.4VDC) (Ripple ratio within 5%)	–	○	External power supply is not required.
	Current	55mA TYP.	–		
Number of occupied points		64 points (Output I/O assignment: 64 points)	64 points (I/O assignment: input)	○	The number of occupied points is 128 points (64points × 2 = 128 points) when using both modules of the QX42 and QY42.
Current consumption		0.11A TYP.	0.09A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 119 (D) mm (9.84(H) × 1.48 (W) × 4.69 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.60kg	0.18kg	○	

*1 The following shows the derating chart.



*2 Check the specifications of the sensor or switches to be connected to the QX40.

(b) Specifications comparison between A42XY (output part) and QY42P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A42XY (Output specification)	QY42P	Compat-ibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Output type		Dynamic scan of 8 input 8	Static	×	Set the static.
Rated load voltage		12/24VDC (10.2 to 26.4VDC) (Ripple ratio within 5%)	12/24VDC (10.2 to 28.8VDC)	○	
Max. output current		50mA per point (Built in limiting resistor (1kΩ) not used)	0.1A/point, 2A/common	○	
Max. voltage drop at ON		1.5V on the source side (Built in limiting resistor not used) 1V on the sink side	0.1VDC (TYP.) 0.1A 0.2VDC (Max.) 0.1A	○	
Max. simultaneously ON		60% when built-in 1kΩ limiting resistor	100% simultaneously ON (50mA/point)	○	
Response time	OFF to ON	16ms or less	1ms or less	○	
	ON to OFF	16ms or less	1ms or less (Rated load, resistive load)	○	
Common terminal arrangement		–	32 points/common (Common terminal: 1A01, 1A02, 2A01, 2A02)	○	
Operation indication		ON indication (LED) Batch of 8 inputs selected by rotary switch	ON indication (LED) 32 point switch-over using switch	○	
External connection method		Output: 32 pin connector	40 pin connector	×	Wiring change is required.
Applicable wire size		0.3mm^2	0.3mm^2 (For A6CON1 or A6CON4)	○	
External power supply	Voltage	12/24VDC (10.2 to 26.4VDC) (Ripple ratio within 5%)	12-24VDC (10.2 to 28.8VDC) (Ripple ratio within 5%)	○	
	Current	180mA TYP.	0.02A (24VDC)/common	○	
Number of occupied points		64 points (I/O assignment: output 64 points)	64 points (I/O assignment: output)	○	The number of occupied points is 128 points (64points × 2 = 128 points) when using both modules of the QX42 and QY42.
Current consumption		0.11A TYP.	0.15A (TYP. all points ON)	△	Reviewing power supply capacity is required.
External dimensions		250 (H) × 37.5 (W) × 119 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight		0.60kg	0.17kg	○	

3.2.4 Interrupt module specifications comparison

(1) Specifications comparison between AI61 and QI60

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AI61	QI60	Compat-ibility	Precautions for replacement
Number of interrupt input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		12V/24VDC	24VDC	△	12VDC are not applicable.
Rated input current		6mA (12VDC) 14mA (24VDC)	Approx. 6mA	△	Reduced. *1
Operating voltage range		10.2 to 26.4VDC	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable.
Maximum number of simultaneous input points		100% Simultaneously ON	100% Simultaneously ON	○	
ON voltage		9VDC or more	19VDC or more/4.0mA or more	△	12VDC are not applicable.
OFF voltage		4VDC or less	11VDC or less/1.7mA or less	△	12VDC are not applicable.
Input resistance		Approx. 2.4kΩ	Approx. 3.9kΩ	△	Input resistance has increased. *1
Response time	OFF to ON	0.2ms or less	0.1ms/0.2ms/0.4ms/0.6ms/1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Use initial value (0.2ms) for the input response time of parameters.
	ON to OFF	0.2ms or less	0.1ms/0.2ms/0.4ms/0.6ms/1ms or less (CPU parameter setting) Initial setting is 0.2ms	○	Use initial value (0.2ms) for the input response time of parameters.
Common terminal arrangement		16 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 1.5mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Number of occupied points		32 points (I/O assignment: Intelligent 32 points)	16 points (I/O assignment: Interrupt)	×	I/O assignment differs.
Current consumption		0.14A (TYP. all points ON)	0.06A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.40kg	0.20kg	○	

*1 Check the specifications of the sensor or switch to be connected to the QI60.

(2) Specifications comparison between AI61-S1 and QI60

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AI61-S1	QI60	Compat-ibility	Precautions for replacement
Number of interrupt input points		16 points	16 points	○	
Insulation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	24VDC	○	
Rated input current		14mA	Approx. 6mA	△	Reduced. *1
Operating voltage range		21.6 to 26.4VDC	20.4 to 28.8VDC (Ripple ratio within 5%)	○	
Maximum number of simultaneous input points		100% Simultaneously ON	100% Simultaneously ON	○	
ON voltage		16VDC or more	19VDC or more/4.0mA or more	△	The ON voltage has been increased. *1
OFF voltage		9VDC or less	11VDC or less/1.7mA or less	△	The OFF voltage has been increased. *1
Input resistance		Approx. 2.4kΩ	Approx. 3.9kΩ	△	Input resistance has increased. *1
Response time	OFF to ON	2ms or less, 8ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Setting 2ms or more input response time in Parameter is not allowed. Set 1ms to the input response time.
	ON to OFF	2ms or less, 8ms or less	0.1ms/0.2ms/0.4ms/0.6ms /1ms or less (CPU parameter setting) Initial setting is 0.2ms	△	Setting 2ms or more input response time in Parameter is not allowed. Set 1ms to the input response time.
Common terminal arrangement		16 points/common (Common terminal: TB9, TB18)	16 points/common (Common terminal: TB17)	○	
Operation indication		ON indication (LED)	ON indication (LED)	○	
External connection method		20-point terminal block connector (M3 × 6 screws)	18-point terminal block (M3 × 6 screws)	×	Wiring change is required.
Applicable wire size		0.75 to 1.5mm^2	0.3 to 0.75mm^2 core (Outside diameter: 2.8mm (0.11 inch) or less)	×	
Applicable solderless terminal		1.25-3, 1.25-YS3A, 2-S3, 2-YS3A, V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3 (Sleeved solderless terminals cannot be used.)	×	
Number of occupied points		32 points (I/O assignment: Interrupt 32 points)	16 points (I/O assignment: Intelligent)	×	I/O assignment differs.
Current consumption		0.14A (TYP. all points ON)	0.06A (TYP. all points ON)	○	
External dimensions		250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	Wiring space is narrow.
Weight		0.40kg	0.20kg	○	

*1 Check the specifications of the sensor or switches to be connected to the QI60.

3.2.5 Blanking module and dummy module specifications comparison

(1) Specifications comparison between AG60 and QG60

○: Compatible, △: Partial change required, ×: Incompatible

Specification	AG60	QG60	Compat-ibility	Precautions for replacement
Number of I/O number occupied points	16 points	16 points	○	
I/O assignment classification	Empty 16 points	Empty 16 points	○	
Application	Use for parts without I/O module (Especially, for parts of empty slot between modules) as dust control.	Mounted to the slot where no I/O module is mounted (Especially between modules) for dust control.	○	
External dimensions	250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86 (H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight	0.17kg	0.07kg	○	

(2) Specifications comparison between AG62 and QG60

○: Compatible, △: Partial change required, ×: Incompatible

Specification	AG62	QG60	Compat-ibility	Precautions for replacement
Number of I/O number occupied points	Max. 64 points (Able to select from 16 points, 32 points, 48 points and 64 points by using the switch on module surface.)	16 points	△	Set the number of occupied points with the I/O assignment of parameter settings.
I/O assignment classification	Depends on the switch setting for the number of input occupied points (16 points, 32 points, 48 points, 64 points)	Empty 16 points	△	
Application	Reserve 16 points, 32 points, 48 points or 64 points in advance for the future need of adding I/O.	Mounted to the slot where no I/O module is mounted (Especially between modules) for dust control.	△	
Other functions	The provided simulation switches for 16 points from the first I/O number allows the input on/off without an external switch.	–	×	Configure with external switches and input modules.
Current consumption	0.07A	–	△	
External dimensions	250 (H) × 37.5 (W) × 121 (D) mm (9.84 (H) × 1.48 (W) × 4.76 (D) inch)	98 (H) × 27.4 (W) × 90 (D) mm (3.86(H) × 1.08 (W) × 3.54 (D) inch)	△	
Weight	0.3kg	0.07kg	○	

3.3 Precautions for I/O Module Replacement

(1) Wiring

(a) Size of wire and crimping terminal

The module and terminal block of the Q series are smaller than the A series, therefore the applicable size of wire and crimping terminal for terminal blocks differ between the two series.
For this reason, use the wire and crimping terminal compatible with the specifications of the Q series I/O module when replacing with the Q series.

The upgrade tool (Conversion adapter) manufactured by Mitsubishi Electric Engineering Co., Ltd.* omits the procedure of changing wiring. (Connection change for power supply and common terminals is required. Also, the conversion adapter fixing plate is necessary when using the conversion adapter.)
As the Q series is a smaller model, wiring space on terminal blocks is narrower. Pay much attention in wiring.

(b) Change from terminal block to connecter

The 32-point I/O modules of the A series uses terminal blocks while that of Q series uses connecters. When using a 32-point I/O module of the Q series shift to the wiring using connecters or convert the connecters to terminal blocks with the following methods.

- Use the converter module for the connecters and terminal block.
- Use the converter module* manufactured by Mitsubishi Electric Engineering Co., Ltd.
- Use the upgrade tool (Conversion adapter)* manufactured by Mitsubishi Electric Engineering Co., Ltd.

* For products manufactured by Mitsubishi Electric Engineering Co., Ltd., contact your local sales representative.

(2) Connecter for external wiring

External wiring connecters are not included in a package of the 32 and 64 points I/O module of the Q series.
Purchase the necessary number of the connecters (A6CON☐) separately.

(3) Precautions for input modules

(a) Specifications change of rated input current

Check the specifications of connecting devices (such as sensors and switches) since rated input current is reduced for some Q series input modules compared to that for the A series.

(b) Specifications change of OFF current

Check the specifications of sensors and switches since some of the Q series input modules support lower OFF current than those of the A series.

(c) Specifications change of maximum number of simultaneous input points

Check the specifications of sensors and switches since some of the Q series input modules have less maximum number of simultaneous input points than those of the A series.
Refer to the derating diagram and use within the range shown in the diagram when replacing with the Q series.

(d) Specifications change of rated voltage value

The QX4☐ and the QX8☐ type DC input module of the Q series are dedicated to 24VDC.
Use QX7☐ at 12VDC.

(e) Specifications change of response time

For the Q series DC input modules, the I/O response time can be set with the parameter.
Set the I/O response time with parameters adjusting it to the response time of the A series input module.

(f) Specifications change of common terminal arrangement

The common terminal arrangement may differ between the A series and Q series.
Pay attention when applying a different voltage to each common.

(4) Precautions for output module

(a) Specifications change of output current value

Some of the Q series output modules support lower output current than those of the A series.
Check the specification of the load side when using the Q series output module with smaller output current.

(b) Specifications change of common terminal arrangement

The common terminal arrangement may differ between the A series and Q series.
Pay attention when applying a different voltage to each common.

(c) Specifications change of common maximum load current

Since the maximum load current per common may differ between the A series and Q series, check them before use.

4 POWER SUPPLY MODULE REPLACEMENTS

4.1 List of Alternative Models for Power Supply Module

A/QnA series models to be discontinued		Q series alternative models	
Product name	Model	Model	Remarks (restrictions)
Power supply module	A61P	Q61P*1	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in specifications: Current capacity is reduced. * When 24VDC is required, prepare the external power supply.
	A61PN		
	A61P-UL		
	A62P	Q62P	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in specifications: Current capacity is reduced.
	A63P	Q63P	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in specifications: Current capacity is reduced.
	A61PEU	Q61P	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in specifications: Current capacity is reduced.
	A62PEU	Q62P	1) Change in external wiring: Required 2) Change in the number of slots : Not required 3) Change in specifications: Current capacity is reduced.
	A68P	None*2	General-purpose switching power supply (For ± 15VDC)

*1 It is also possible to replace this model with the power supply module Q61SP. However, check for the details since the specification differs.
(Example) Q61SP: rated output current (5VDC 2A), mountable only to the main base unit (Q3□SB)

*2 A power supply of each Q series module that requires power feeding to external is "24VDC".
A "15VDC" power supply for Q series module is not required.

Point

When replacing the A/QnA series with power supply module of the A61PN by the Q series, replacing the A61PN by the Q61P is recommended.
(For specifications comparisons between the A61PN and Q61P, refer to Section 4.2 (2).)
The A61PN can be used as a spare part for the A/QnA series or as a power supply module for the QA6□B extension base unit.

4.2 Power Supply Module Specifications Comparisons

(1) Specifications comparison between A61P(-UL) and Q61P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A61P(-UL)	Q61P	Compat-ibility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC) 200-240VAC+10%-15% (170 to 264VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	The Q61P is wide range type applicable to 100 to 240VAC.
Input frequency		50/60Hz ± 5%	50/60Hz ± 5%	○	
Input voltage distortion		5% or less	5% or less	○	
Max. input apparent power		160VA	130VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	8A	6A	△	Check the current consumption of entire system.
	24VDC	–	–	–	
Overcurrent protection	5VDC	8.8A or more	6.6A or more	○	
	24VDC	–	–	–	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	70% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		R1.25-4, R2-4 RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		78 to 118N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	△	
Weight (kg)		0.98	0.40	○	
Allowable momentary power failure period		within 20ms	within 20ms	○	
Noise durability		Noise voltage 1500Vp-p	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	○	
Dielectric withstand voltage		Across external AC terminal batch and ground: 1500VAC for 1 minute Across external DC terminal batch and ground: 500VAC for 1 minute	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	○	
Insulation resistance		Across external AC terminal batch and ground 5MΩ or more by 500VDC insulation resistance tester.	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(2) Specifications comparison between A61PN and Q61P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A61PN	Q61P	Compat-ibility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC) 200-240VAC+10%-15% (170 to 264VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	The Q61P is wide range type applicable to 100 to 240VAC.
Input frequency		50/60Hz ± 5%	50/60Hz ± 5%	○	
Input voltage distortion		5% or less	5% or less	○	
Max. input apparent power		160VA	130VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	8A	6A	△	Check the current consumption of entire system.
	24VDC	–	–	–	
Overcurrent protection	5VDC	8.8A or more	6.6A or more	○	
	24VDC	–	–	–	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	70% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		R1.25-4, R2-4 RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		78 to 118N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	△	
Weight (kg)		0.75	0.40	○	
Allowable momentary power failure period		within 20ms	within 20ms	○	
Noise durability		Noise voltage 1500Vp-p	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	○	
Dielectric withstand voltage		Across external AC terminal batch and ground: 1500VAC for 1 minute Across external DC terminal batch and ground: 500VAC for 1 minute	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	○	
Insulation resistance		Across external AC terminal batch and ground 5MΩ or more by insulation resistance tester.	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(3) Specifications comparison between A62P and Q62P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A62P	Q62P	Compat-ibility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC) 200-240VAC+10%-15% (170 to 264VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	The Q62P is wide range type applicable to 100 to 240VAC.
Input frequency		50/60Hz ± 5%	50/60Hz ± 5%	○	
Input voltage distortion		5% or less	5% or less	○	
Max. input apparent power		155VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	5A	3A	△	Check the current consumption of entire system.
	24VDC	0.8A	0.6A	△	
Overcurrent protection	5VDC	5.5A or more	3.3A or more	○	
	24VDC	1.2A or more	0.66A or more	○	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		R1.25-4, R2-4 RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		78 to 118N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	△	
Weight (kg)		0.94	0.39	○	
Allowable momentary power failure period		within 20ms	within 20ms	○	
Noise durability		Noise voltage 1500Vp-p	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	○	
Dielectric withstand voltage		Across external AC terminal batch and ground: 1500VAC for 1 minute Across external DC terminal batch and ground: 500VAC for 1 minute	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	○	
Insulation resistance		Across external AC terminal batch and ground 5MΩ or more by insulation resistance tester.	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(4) Specifications comparison between A63P and Q63P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A63P	Q63P	Compat-ibility	Precautions for replacement
Input power supply		24VDC+30%-35% (15.6 to 31.2VDC)	24VDC+30%-35% (15.6 to 31.2VDC)	○	
Input frequency		–	–	–	
Input voltage distortion		–	–	–	
Max. input apparent		65W	45W	○	
Inrush current		100A within 1ms	100A within 1ms at 24VDC input	○	
Rated output current	5VDC	8A	6A	△	Check the current consumption of entire system.
	24VDC	–	–	–	
Overcurrent protection	5VDC	8.5A or more	6.6A or more	○	
	24VDC	–	–	–	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	70% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		R1.25-4, R2-4 RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		78 to 118N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	△	
Weight (kg)		0.8	0.33	○	
Allowable momentary power failure period		Within 1ms	Within 10ms at 24VDC input	○	
Noise durability		Noise voltage 500Vp-p	By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency	○	
Dielectric withstand voltage		Across external DC terminal batch and ground: 500VAC for 1 minute	Between all inputs-LG and all outputs-FG: 500VAC for one minute	○	
Insulation resistance		Across external DC terminals batch and ground 5MΩ or more by insulation resistance tester.	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1	None	×	Fuses are not included in accessories since they are not replaceable.

(5) Specifications comparison between A61PEU and Q61P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A61PEU	Q61P	Compat-ibility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC) 200-240VAC+10%-15% (170 to 264VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	The Q61P is wide range type applicable to 100 to 240VAC.
Input frequency		50/60Hz ± 5%	50/60Hz ± 5%	○	
Input voltage distortion		5% or less	5% or less	○	
Max. input apparent power		130VA	130VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	8A	6A	△	Check the current consumption of entire system.
	24VDC	–	–	–	
Overcurrent protection	5VDC	8.8A or more	6.6A or more	○	
	24VDC	–	–	–	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	70% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		98 to 137N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	△	
Weight (kg)		0.80	0.40	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		By noise simulator of noise voltage of IEC801-4, 2KV, 1500Vp-p, noise width of 1μs, and noise frequency of 25 to 60Hz	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	○	
Dielectric withstand voltage		Between primary side and FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	○	
Insulation resistance		Between all inputs and all outputs (LG and FG separated), between all inputs and LG/FG, between all outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(6) Specifications comparison between A62PEU and Q62P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A62PEU	Q62P	Compat-ibility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC) 200-240VAC+10%-15% (170 to 264VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	The Q62P is wide range type applicable to 100 to 240VAC.
Input frequency		50/60Hz ± 5%	50/60Hz ± 5%	○	
Input voltage distortion		5% or less	5% or less	○	
Max. input apparent power		155VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	5A	3A	△	Check the current consumption of entire system.
	24VDC	0.8A	0.6A	△	
Overcurrent protection	5VDC	5.5A or more	3.3A or more	○	
	24VDC	1.2A or more	0.66A or more	○	
Overvoltage protection	5VDC	–	5.5 to 6.5V	○	
	24VDC	–	–	–	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED display	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 screws	×	Wiring change is required.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring change is required.
Applicable tightening torque		98 to 137N·cm	66 to 89N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm (9.84 (H) × 2.33 (W) × 4.76 (D) inch)	98(H) × 55.2(W) × 90(D) mm (3.86 (H) × 2.33 (W) × 3.54 (D) inch)	–	
Weight (kg)		0.9	0.39	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		By noise simulator of noise voltage of IEC801-4, 2KV, 1500Vp-p, noise width of 1μs, and noise frequency of 25 to 60Hz	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	○	
Dielectric withstand voltage		Between primary side and FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))	○	
Insulation resistance		Between all inputs and all outputs (LG and FG separated), between all inputs and LG/FG, between all outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	• Between all inputs-LG and all outputs-FG • Between all inputs and LG • Between all outputs and FG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(7) Specifications of A68P

Specification		A68P
Input power supply		100-120VAC+10%-15% (85 to 132VAC)
		200-240VAC+10%-15% (170 to 264VAC)
Input frequency		50/60Hz ± 5%
Input voltage distortion		-
Max. input apparent power		95VA
Inrush current		20A within 8ms
Rated output current	+15VDC	1.2A
	-15VDC	0.7A
Overcurrent protection	+15VDC	1.64A or more
	-15VDC	0.94A or more
Efficiency		65% or more
Power indication		Power LED display
Power ON indication		Contact output
		Switched on if +15VDC output is +14.25V or higher or -15VDC output is -14.25V or lower.
		Min. contact switching load: 5VDC, 10mA Max. contact switching load: 264VAC, 2A (R load)
Terminal screw size		M3 × 0.5 × 6
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		V1.25-4, V1.25-YS4A, V2-S4, V2-YS4A
Applicable tightening torque		68N·cm
External dimensions		250(H) × 75.5(W) × 121(D) mm (9.84 (H) × 2.97 (W) × 4.76 (D) inch)
Weight (kg)		0.9

A power supply of each Q series module that requires power feeding to external is "24VDC".
A "15VDC" power supply for Q series module is not required for replacement to the Q series.
Note that when utilizing existing modules using such as the QA extension base unit or when using the A series module that requires "15VDC" power supply for replacement to the Q series, substitute the general-purpose switching power supply, whose specifications are shown below, for the A68P.
Choose current capacity by the calculation result of current consumption for the entire system used.
Substitute the general-purpose switching power supply, whose specifications are shown below, for the A68P. Choose current capacity with the result of calculating the current consumption of entire system to be used.

Specification	General-purpose switching power supply
Voltage	+15VDC ± 3%(14.55V to 15.45V)
	-15VDC ± 3%(-14.55 to -15.45V)
Ripple voltage	50mVp-p or less
Spike voltage	100mVp-p or less
Output voltage limit	Within ± 1V

4.3 Precautions for Power Supply Module Replacement

(1) Current consumption differs between the Q series and A series modules. Select the power supply module with the result of calculating the current consumption of entire system.

(2) Applicable wire and crimping terminals for terminal blocks differ between the Q series and the A series. Use the wire and crimping terminals compatible with the specifications.

(3) Input power supply of the Q61P and Q62P is wide range type applicable to 100 to 200VAC.
The power supply can be used for operating voltage of both 100VAC and 200VAC.

(4) The large-capacity type power supply Q64PN (8.5A) for the Q series is also available. It is recommended to use it when larger current capacity is necessary.

5 BASE UNIT AND EXTENSION CABLE REPLACEMENT

5.1 List of Alternative Models for Base Unit and Extension Cable

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Main base unit	A32B	Q32SB	An extension base unit can be connected. → cannot be connected.
	A35B	Q35B	
	A38B	Q38B	
	A38B-UL	Q38B	
	A32B-E	Q32SB	An extension base unit can be connected. → cannot be connected.
	A35B-E	Q35B	
	A38B-E	Q38B	
	A32B-S1	Q33B	Number of I/O slots: 2 slots → 3 slots
	A38HB	Q38B	
	A38HBEU	Q38B	
Extension base unit	A52B	Q52B	
	A55B	Q55B	
	A58B	Q55B	Q55B × 2 units Number of I/O slots: 8 slots → 5 slots × 2 units
	A62B	Q63B	Number of I/O slots: 2 slots → 3 slots
	A65B	Q65B	
	A68B	Q68B	
	A68B-UL	Q68B	
Extension cable	AC06B	QC06B	
	AC12B	QC12B	
	AC30B	QC30B	
	AC50B	QC50B	
	A1SC05NB	QC05B	Parallel mounting is not allowed.
	A1SC07NB	QC06B	Parallel mounting is not allowed. Cable length: 0.7m → 0.6m
	A1SC30NB	QC30B	
	A1SC50NB	QC50B	

5.2 Base Unit and Extension Cable Specifications Comparison

5.2.1 Base unit specifications comparison

(1) Main base unit

(a) Comparisons between A32B(-E) and Q32SB

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A32B(-E)	Q32SB	
Loaded I/O modules	2 can be loaded		Refer to Section 5.3.1 for replacement precautions. When using the upgrade tool (base adapter) with existing mounting holes, use the Q33B. For extension connection, use a main base unit supporting the connection.
Extendability	Not extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 247(W) × 29(D) mm (9.84(H) × 9.72(W) × 1.14(D) inch)	98(H) × 114(W) × 18.5(D) mm (3.86(H) × 4.49(W) × 0.73(D) inch)	
Mounting dimensions to the panel	227 × 200 mm (8.94 × 7.87 inch)	101 × 80 mm (3.98 × 3.15 inch)	

(b) Comparisons between A32B-S1 and Q33B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A32B-S1	Q33B	
Loaded I/O modules	2 can be loaded	3 can be loaded	Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) for the A32B-S1 is not available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 268(W) × 29(D) mm (9.84(H) × 10.55(W) × 1.14(D) inch)	98(H) × 189(W) × 44.1(D) mm (3.86(H) × 7.44(W) × 1.74(D) inch)	
Mounting dimensions to the panel	248 × 200 mm (9.76 × 7.87 inch)	169 × 80 mm (6.65 × 3.15 inch)	

(c) Comparisons between A35B(-E) and Q35B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A35B(-E)	Q35B	
Loaded I/O modules	5 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 382(W) × 29(D) mm (9.84(H) × 15.04(W) × 1.14(D) inch)	98(H) × 245(W) × 44.1(D) mm (3.86(H) × 9.65(W) × 1.74(D) inch)	
Mounting dimensions to the panel	362 × 200 mm (14.25 × 7.87 inch)	224.5 × 80 mm (8.84 × 3.15 inch)	

(d) Comparisons between A38B(-E/-UL)/A38HB/A38HBEU and Q38B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A38B(-E/-UL)/A38HB/A38HBEU	Q38B	
Loaded I/O modules	8 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 480(W) × 29(D) mm (9.84(H) × 18.90(W) × 1.14(D) inch)	98(H) × 328(W) × 44.1(D) mm (3.86(H) × 12.91(W) × 1.74(D) inch)	
Mounting dimensions to the panel	460 × 200 mm (18.11 × 7.87 inch)	308 × 80 mm (12.13 × 3.15 inch)	

(2) Extension base unit (No power supply module required)

(a) Comparisons between A52B and Q52B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A52B	Q52B	
Loaded I/O modules	2 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 183(W) × 29(D) mm (9.84(H) × 7.20(W) × 1.14(D) inch)	98(H) × 106(W) × 44.1(D) mm (3.86(H) × 4.17(W) × 1.74(D) inch)	
Mounting dimensions to the panel	163 × 200 mm (6.42 × 7.87 inch)	83.5 × 80 mm (3.29 × 3.15 inch)	

(b) Comparisons between A55B and Q55B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A55B	Q55B	
Loaded I/O modules	5 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 297(W) × 29(D) mm (9.84(H) × 11.69(W) × 1.14(D) inch)	98(H) × 189(W) × 44.1(D) mm (3.86(H) × 7.44(W) × 1.74(D) inch)	
Mounting dimensions to the panel	277 × 200 mm (10.91 × 7.87 inch)	167 × 80 mm (6.57 × 3.15 inch)	

(c) Comparisons between A58B and two Q55Bs

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A58B	Q55B × 2	
Loaded I/O modules	8 can be loaded	5 units × 2 can be loaded	Refer to Section 5.3.1 for replacement precautions. When using the upgrade tool (base adapter) with existing mounting holes, use the Q68B.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 411(W) × 29(D) mm (9.84(H) × 16.18(W) × 1.14(D) inch)	(98(H) × 189(W) × 44.1(D) mm) × 2 ((3.86(H) × 7.44(W) × 1.74(D) inch) × 2)	
Mounting dimensions to the panel	391 × 200 mm (5.39 × 7.87 inch)	(167 × 80 mm) × 2 ((6.57 × 3.15 inch) × 2)	

(3) Extension base unit (Power supply module loaded)

(a) Comparisons between A62B and Q63B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A62B	Q63B	
Loaded I/O modules	2 can be loaded	3 can be loaded	Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 283(W) × 29(D) mm (9.84(H) × 11.14(W) × 1.14(D) inch)	98(H) × 189(W) × 44.1(D) mm (3.86(H) × 7.44(W) × 1.74(D) inch)	
Mounting dimensions to the panel	218 × 200 mm (8.58 × 7.87 inch)	167 × 80 mm (6.57 × 3.15 inch)	

(b) Comparisons between A65B and Q65B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A65B	Q65B	
Loaded I/O modules	5 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 352(W) × 29(D) mm (9.84(H) × 13.86(W) × 1.14(D) inch)	98(H) × 245(W) × 44.1(D) mm (3.86(H) × 9.65(W) × 1.74(D) inch)	
Mounting dimensions to the panel	332 × 200 mm (13.07 × 7.87 inch)	222.5 × 80 mm (8.76 × 3.15 inch)	

(c) Comparisons between A68B (-UL) and Q68B

Item	Model		Precautions for replacement
	A/QnA series	Q series	
	A68B(-UL)	Q68B	
Loaded I/O modules	8 can be loaded		Refer to Section 5.3.1 for replacement precautions. The upgrade tool (base adapter) with existing mounting holes is available.
Extendability	Extendable		
Mounting hole size	∅6 bell-shaped hole (For M5 screw)	M4 screw hole or ∅4.5 hole (For M4 screw)	
External dimensions	250(H) × 466(W) × 29(D) mm (9.84(H) × 18.35(W) × 1.14(D) inch)	98(H) × 328(W) × 44.1(D) mm (3.86(H) × 12.91(W) × 1.74(D) inch)	
Mounting dimensions to the panel	446 × 200 mm (17.56 × 7.87 inch)	306 × 80 mm (12.05 × 3.15 inch)	

5.2.2 Extension cables specifications comparison

Item		Model			Precautions for replacement
		A/QnA series		Q series	
		A main–A extension	AnS main–A extension		
Cable length	0.45m	–	A1SC05NB	QC05B	Refer to Section 5.3.2 for replacement precautions.
	0.6m	AC06B	–	QC06B	
	0.7m	–	A1SC07NB	QC06B	
	1.2m	AC12B	–	QC12B	
	3.0m	AC30B	A1SC30NB	QC30B	
	5.0m	–	A1SC50NB	QC50B	
	10.0m	–	–	QC100B	

5.3 Precautions for Base Unit and Extension Cable Replacement

5.3.1 Precautions for base unit replacement

(1) When replacing the A/QnA series base unit with the Q series, it is necessary to redo the mounting holes to fix the unit to a control panel, since the two series have different mounting hole size.

(2) When using the existing mounting holes to install the Q series base unit, use the upgrade tool (base adapter) manufactured by Mitsubishi Electric Engineering Co., Ltd. This base adapter allows to omit the procedure of redoing mounting holes.
For products manufactured by Mitsubishi Electric Engineering Co., Ltd., contact your local sales representative.

5.3.2 Precautions for extension cable replacement

The total extension distance of the Q series extension cable is 13.2m while that of the A series is 6.6m. Select a suitable cable according to your system.

5.4 QA(1S) Extension Base Unit

When replacing the A/QnA series CPU by the Q series using the QA(1S) extension base unit, A series-compatible module can be utilized without change.

5.4.1 QA(1S) extension base unit specifications

Item		Model				
		QA1S51B	QA1S65B	QA1S68B	QA65B	QA68B
Number of mountable I/O modules		1	5	8	5	8
Extendability		Not extendable	Extendable			
Applicable module		AnS series module			A series module	
5 VDC internal current consumption		0.12A	0.12A	0.12A	0.12A	0.12A
Mounting hole size		M5 screw hole or ϕ5.5 hole (For M5 screw)			M5 screw hole or ϕ5.5 hole (For M5 screw)	
External dimensions	H	130mm (5.12inch)			250mm (9.84inch)	
	W	100mm (3.94inch)	315mm (12.4inch)	420mm (16.55inch)	352mm (13.86inch)	466mm (18.34inch)
	D	50.7mm (1.99inch)	51.2mm (2.02inch)		46.6mm(1.83inch)	
Weight		0.23kg	0.75kg	1.00kg	1.60kg	2.00kg
Accessory		mounting screw M5 × 25 3screws	mounting screw M5 × 25 4screws		–	

5.4.2 Applicable QCPU

The following table shows CPU models that can use the QA(1S) extension base unit as an extension base unit for the QCPU.

CPU Model		Availability
Basic model QCPU	Q00JCPU	Unusable
	Q00CPU	
	Q01CPU	
High Performance model QCPU	Q02CPU	Usable
	Q02HCPU	
	Q06HCPU	
	Q12HCPU	
	Q25HCPU	
Universal model QCPU	(All CPU models)	Usable *1
Process CPU	Q12PHCPU	Unusable
	Q25PHCPU	
Redundant CPU	Q12PRHCPU	Unusable
	Q25PRHCPU	
A mode CPU	Q02CPU-A	QA extension base unit: Unusable QA1S extension base unit: Usable
	Q02HCPU-A	
	Q06HCPU-A	

*1 Use the Universal model QCPU with a serial number (first five digits) of "13102" or later.

5.4.3 Extension cable

Item	Model					
	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Cable length	0.45m (1.48ft.)	0.6m (1.97ft.)	1.2m (3.94ft.)	3.0m (9.84ft.)	5.0m (16.40ft.)	10.0m (32.81ft.)
Weight	0.15kg	0.16kg	0.22kg	0.40kg	0.60kg	1.11kg

5.4.4 System configuration

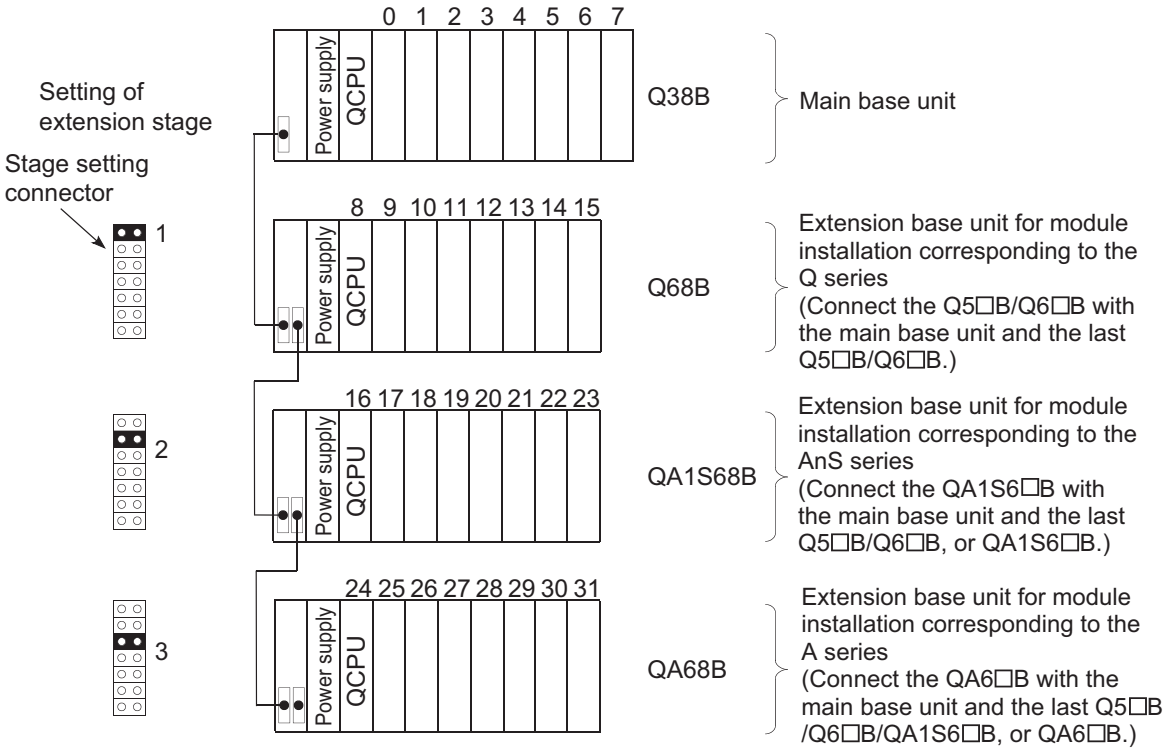
This section explains the system configuration and precautions for use of the QA(1S)6☐B type extension base unit.

(1) Connection order of extension base units

When the Q6☐B, QA1S6☐B, QA1S51B, and QA6☐B are used together, connect the units in order of Q6☐B, QA1S6☐B, QA1S51B, and QA6☐B from the nearest position of the main base unit.
The QA1S51B is not extendable. When the QA1S51B is used, the QA6☐B cannot be used.

(2) Connection order of extension base units upon setting the extension stage number

To use extension base units, it is necessary to set extension stage numbers (1 to 7) with the stage number setting connector.
Set the extension stage number 1 to the connected extension base unit closest to the main base unit, and the following extension stage number (up to 7) to the following extension base units in the connected order.



Remarks

(1) Normal operations of the A series AC input module cannot be guaranteed if there is no base unit on which the A series power supply module is mounted.
Use the A series AC input module in either of the following configurations.
- Mount the A series AC input module on the A5□B to which the QA6ADP is attached, or connect the QA6□B or A6□B to which the QA6ADP is attached as another extension base unit.

(2) The extension base unit for large-sized A series with QA conversion adapter mounted and QA1S extension base unit cannot be used together. (When connecting the extension base unit with QA conversion adapter mounted, QA1S extension base unit cannot be connected.

(3) When the QA6□B is connected to a Q series extension base unit, the QA6□B and QA1S□B are used together, or the QA1S51B is used, a GOT cannot be bus-connected.
However, when only the QA1S6□B is connected, a GOT can be bus-connected.

5.4.5 System equipment list

(1) QA(1S) extension base unit

The following table lists configurable devices that can be used with the QA1S51B or QA1S6□B extension base unit.

Product	Model				Remarks
Power supply module	A1S61PN,	A1S62PN,	A1S63P		
Input module	A1SX10, A1SX30, A1SX41, A1SX42-S1, A1SX80-S1, A1SX82-S1,	A1SX10EU, A1SX40, A1SX41-S1, A1SX42-S2, A1SX80-S2, A1SX42X	A1SX20, A1SX40-S1, A1SX41-S2, A1SX71, A1SX81,	A1SX20EU, A1SX40-S2, A1SX42, A1SX80, A1SX81-S2,	
Output module	A1SY10, A1SY18AEU, A1SY40P, A1SY50, A1SY71, A1S42Y	A1SY10EU, A1SY22, A1SY41, A1SY60, A1SY80,	A1SY14EU, A1SY28A, A1SY41P, A1SY60E, A1SY81,	A1SY18A, A1SY40, A1SY42P, A1SY68A, A1SY82,	
I/O module	A1SH42,	A1SH42-S1,	A1SX48Y58,	A1SX48Y18	
High-speed counter module	A1SD61, A1SD62D-S1	A1SD62,	A1SD62E,	A1SD62D,	*1
A/D converter module	A1S64AD,	A1S68AD			
D/A converter module	A1S62DA,	A1S68DAI,	A1S68DAV		
Analog I/O module	A1S63ADA,	A1S66ADA			
Temperature input module	A1S62RD3N,	A1S62RD4N,	A1S68TD		
Temperature control module	A1S62TCTT-S2, A1S62TCRT-S4, A1S64TCTT-S1, A1S64TCRT-S1,	A1S62TCRTBW-S2, A1S62TCTTBW-S2, A1S64TCTTBW-S1, A1S64TCRTBW-S1	A1S64TCTRT, A1S64TCTRTBW,		
Pulse catch module	A1SP60				
Analog timer module	A1ST60				
Interrupt module	A1SI61				*3
Positioning module	A1SD70				
	A1SD75P1-S3,	A1SD75P2-S3,	A1SD75P3-S3		*1
	A1SD75M1,	A1SD75M2,	A1SD75M3		*1
MELSECNET/MINI-S3 master module	A1SJ71PT32-S3				*1
Intelligent communication module	A1SD51S				*2
MELSECNET, MELSECNET/B local station data link module	A1SJ71AP23Q,	A1SJ71AR23Q,	A1SJ71AT23BQ		
Position detection module	A1S62LS				
PC fault detection module	A1SS91				
Memory card interface module	A1SD59J-S2				
ID interface module	A1SD35ID1,	A1SD35ID2			*2
MELSEC-I/O LINK master module	A1SJ51T64				
B/NET interface module	A1SJ71B62-S3				
S-LINK master module	A1SJ71SL92N				
AS-i master module	A1SJ71AS92				
Blank cover	A1SG60				
Dummy module	A1SG62				

*1 The dedicated instructions in QnA/A series program are not applicable to the QCPU program. Replace them with the FROM/TO instructions.

*2 When the QA1S51B and QA1S6□B are used, up to six modules having the same product name can be mounted to the QA1S51B and QA1S6□B.

*3 Only one interrupt module any of QI60, A1SI61, AI61, and AI61-S1 can be used.

(2) QA extension base unit

The following table shows modules that can be used on the QA6□B extension base unit.

Product	Model				Remarks
Power supply module	A61P, A67P, A62PEU	A62P, A66P,	A63P, A68P,	A65P, A61PEU,	
Input module	AX10, AX21, AX40, AX42-S1, AX60-S1, AX80E, AX81-S3,	AX11, AX21EU, AX41, AX50, AX70, AX81, AX81B,	AX11EU, AX31, AX41-S1, AX50-S1, AX71, AX81-S1, AX82	AX20, AX31-S1, AX42, AX60, AX80, AX81-S2,	
Output module	AY10, AY11E, AY13E, AY22, AY40A, AY42-S1, AY50, AY60S, AY71, AY81,	AY10A, AY11AEU, AY13EU, AY23, AY41, AY42-S2, AY51, AY60E, AY72, AY81EP,	AY11, AY11EEU, AY15EU, AY40, AY41P, AY42-S3, AY51-S1, AY60EP, AY80, AY82EP	AY11A, AY13, AY20EU, AY40P, AY42, AY42-S4, AY60, AY70, AY80EP,	
I/O module	A42XY,	AH42			
High-speed counter module	AD61,	AD61S1			*1
A/D converter module	A68AD,	A68AD-S2,	A68ADN,	A616AD	
D/A converter module	A62DA, A616DAV,	A62DA-S1, A616DAI	A68DAV,	A68DAI-S1,	
Temperature-digital converter module	A68RD3, A60MXR,	A68RD4, A60MXT	A616TD,	A60MX,	
Interrupt module	AI61,	AI61-S1			*3
Positioning module	AD70, AD71S2,	AD70D, AD71S7,	AD71, AD72,	AD71S1, AD778M	
	AD75P1-S3,	AD75P2-S3,	AD75P3-S3		*1
	AD75M1,	AD75M2,	AD75M3		*1
MELSECNET/MINI-S3 master module	AJ71PT32-S3,	AJ71T32-S3			*1
Intelligent communication module	AD51-S3,	AD51H-S3			*2
Position detection module	A61LS,	A62LS-S5,	A63LS		
PC fault detection module	AS91				
Memory card interface module	AD59,	AD59-S1			
Supersonic linear scale interface module	A64BTL				
ID interface module	AJ71ID1-R4,	AJ71ID2-R4			*2
	AD32ID1,	AD32ID2			
MELSEC-I/OLINK module	AJ51T64				
B/NET interface module	AJ71B62-S3				
External failure diagnostics module	AD51FD-S3				
Voice output module	A11VC				
Vision sensor module	AS50VS,	AS50VS-GN			
Blanking module	AG60				
Dummy module	AG62				
A-A1S module conversion adapter	A1ADP-XY,	A1ADP-SP			*4

*1 The dedicated instructions in QnA/A series program are not applicable to the QCPU program. Replace them with the FROM/TO instructions.

*2 When the QA1S51B and QA1S6□B are used, up to six modules having the same product name can be mounted to the QA1S51B and QA1S6□B.

*3 Only one interrupt module any of QI60, A1SI61, AI61 and AI61-S1 can be used.

*4 For mountable modules, refer to Section 5.5.2.

5.4.6 I/O address for the QA(1S) extension base unit and QA conversion adapter

This section explains I/O address (I/O assignment) when using the QA(1S) extension base unit and QA conversion adapter.

(1) Concept of I/O address when using the QA(1S) extension base unit and QA conversion adapter

I/O address when using the QA(1S) extension base unit and QA conversion adapter can be assigned to either of the following.

(a) Assign the I/O address of the Q series module to the lowest address and assign that of the A series module to the Q series module I/O address + 1 or later.

(b) Assign the I/O address of the A series module to the lowest address and assign that of the Q series module to the A series module I/O address + 1 or later.

Point

I/O address can be assigned by either of the following address orders.
1) Q series module → A series module
2) A series module → Q series module

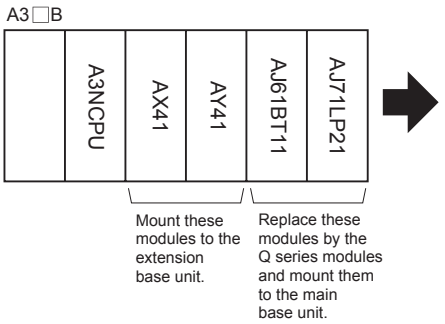
Note that the CPU module does not start due to an error if the address is assigned in the order of Q series module → A series module → Q series module and vice versa.

(2) I/O address assignment example

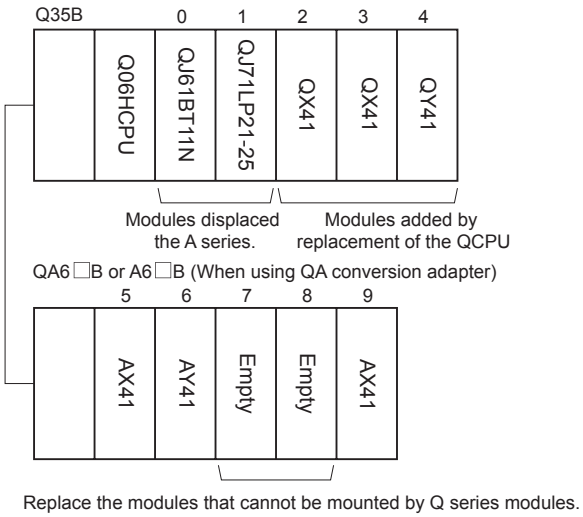
The following explains assignment example to modify the program at minimum by using the QA6□B extension base unit and utilizing the existing A series module without I/O address change.

(a) System configuration example

(Existing system configuration example)



(System configuration example after replacement)



As the CC-Link master/local module, MELSECNET/10(H) network module cannot be utilized, replace them by QCPU-compatible modules.

(b) I/O assignment example of the parameter

(Q35B side)

		Type	Number of occupied points	Address
Main base unit	0	Intelligent	32 points	100
	1	Intelligent	32 points	120
	2	Input	32 points	140
	3	Input	32 points	160
	4	Output	32 points	180

(QA6□B side)

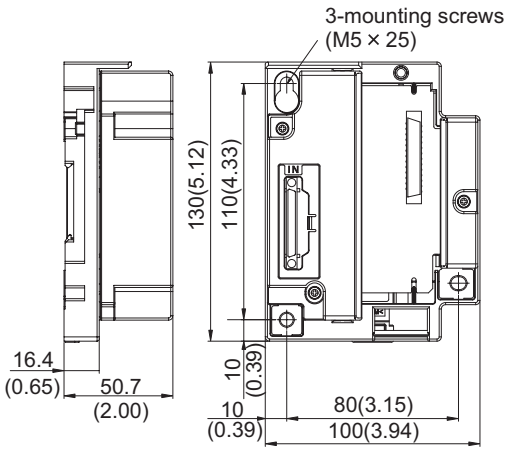
		Model	Type	Number of occupied points	Address
Extension base unit	5	AX41	Input	32 points	00
	6	AY41	Output	32 points	20
	7		Empty	32 points	40
	8		Empty	32 points	60
	9	AX41	Input	32 points	80

The program can be utilized without changing the I/O address of the existing A series module by the I/O assignment above.

5.4.7 External dimensions

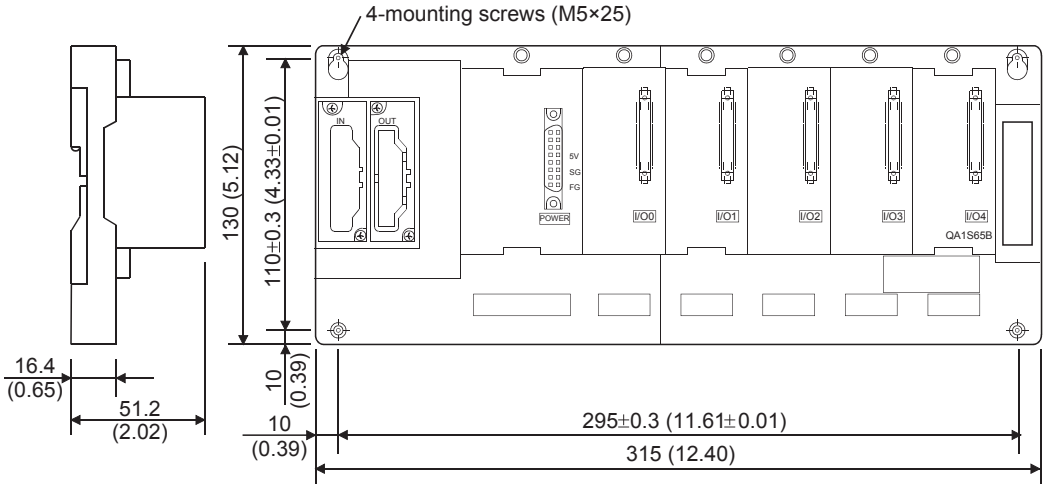
The following diagram shows the external dimensions of the QA(1S) extension base unit.

(1) QA1S51B



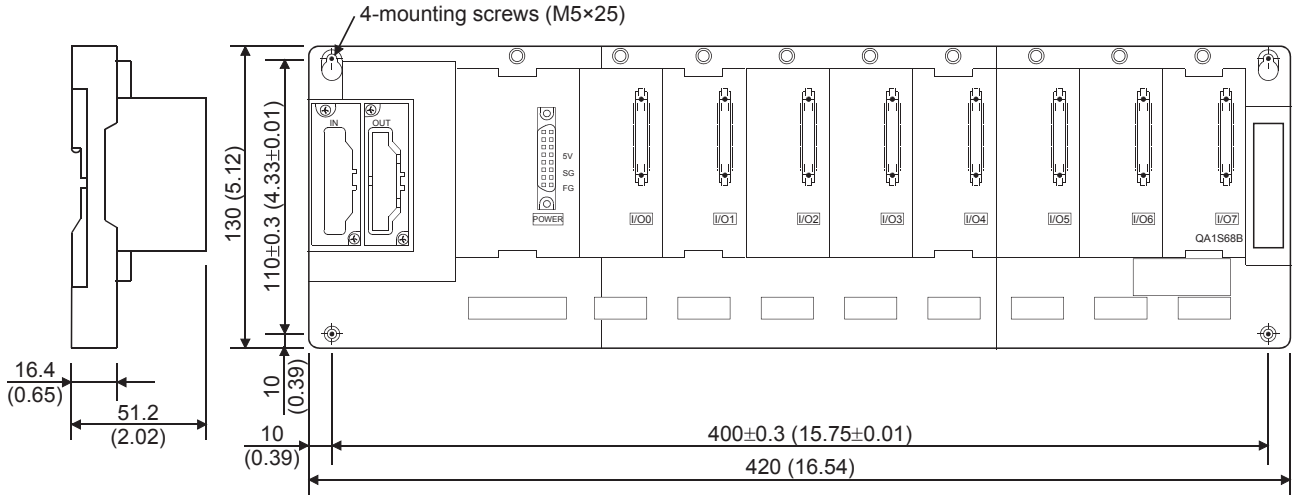
Unit : mm (inch)

(2) QA1S65B



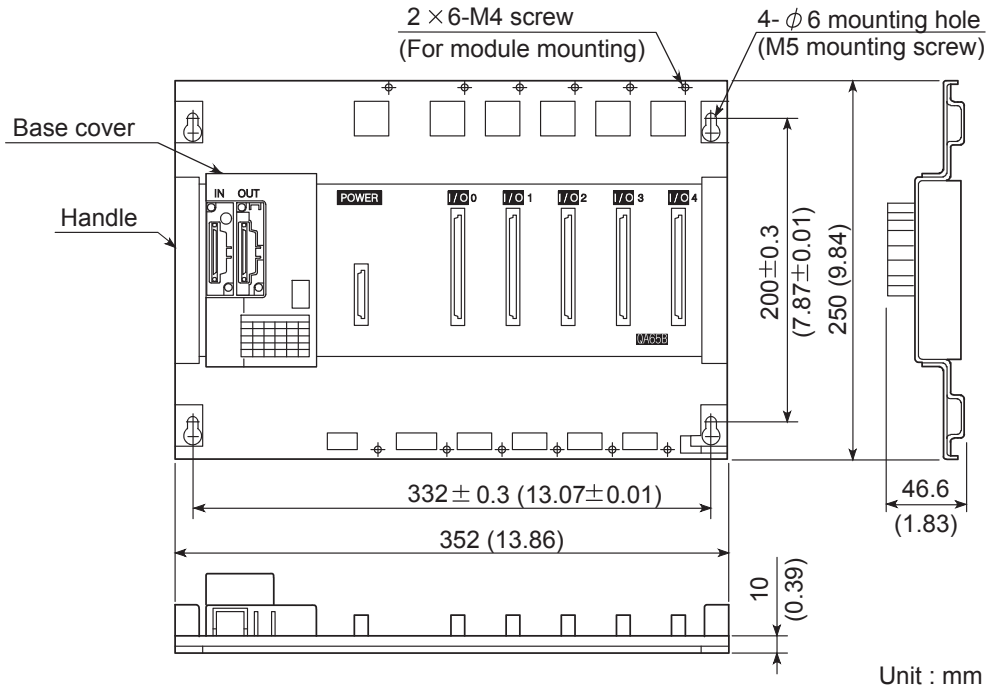
Unit : mm (inch)

(3) QA1S68B



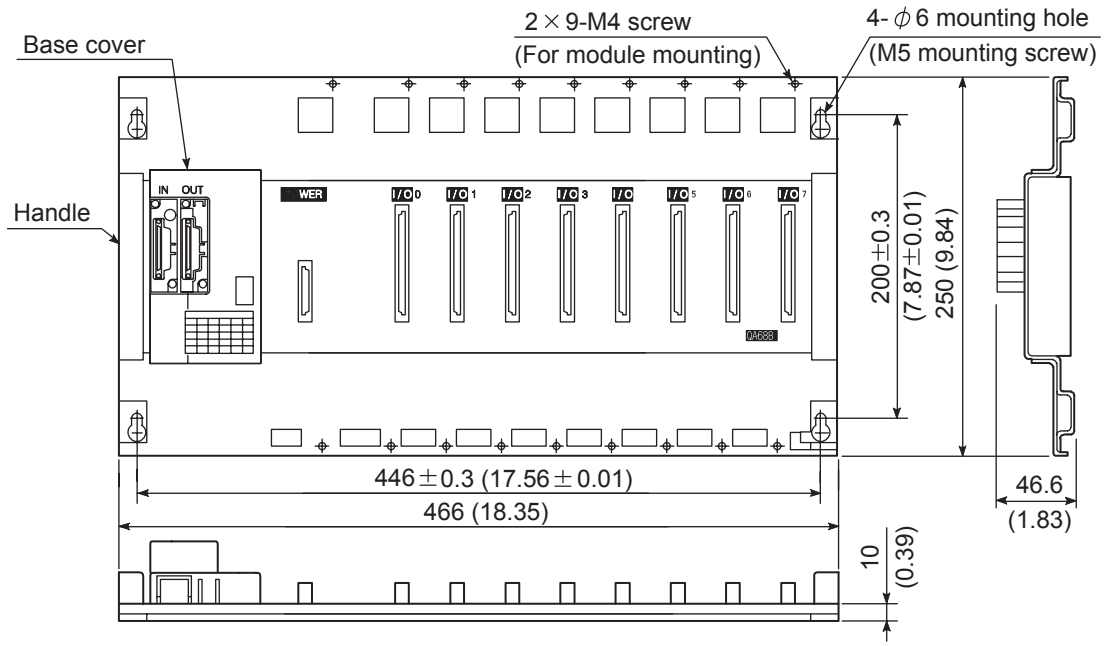
Unit : mm (inch)

(4) QA65B



Unit : mm (inch)

(5) QA68B



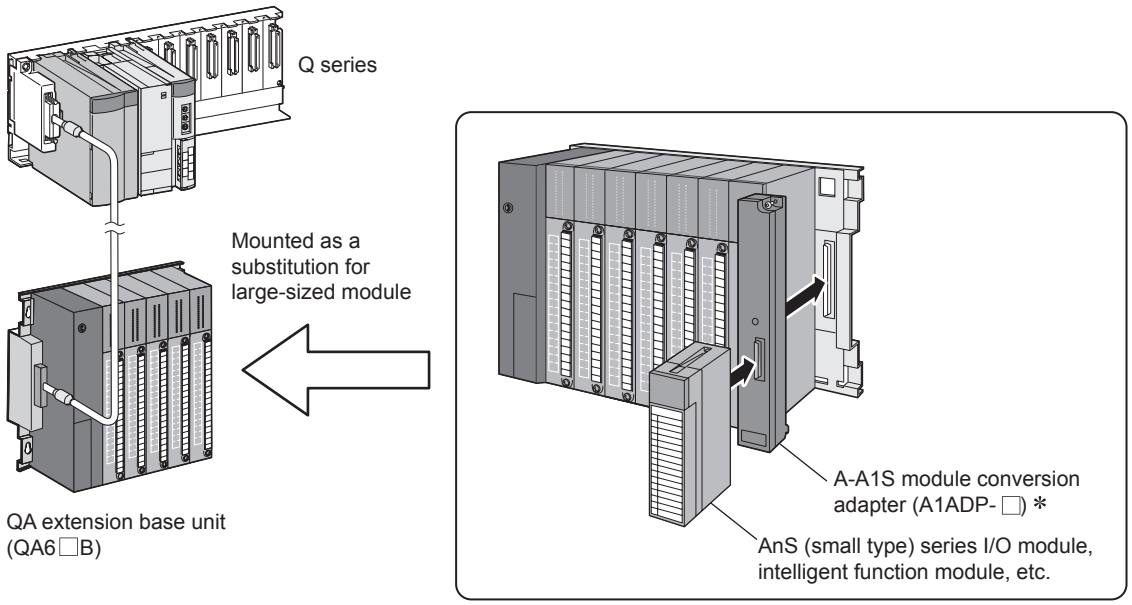
Unit : mm (inch)

5.5 A-A1S Module Conversion Adapter

This section explains the A-A1S module conversion adapter (A1ADP) to leverage the spare part (AnS (small type) series module) for the existing large-sized A series module.

5.5.1 System configuration

Using the A1ADP in the A (large type) series extension base unit with the QA extension base unit or QA conversion adapter mounted, the AnS series I/O module/special function module can be mounted.



* The A-A1S conversion module adapter has the following two types according to a type of mounted module.
A1ADP-XY •••••••• For AnS series I/O modules
A1ADP-SP •••••••• For AnS series special function modules

Point

1) When modules are mounted in either of the following combinations, the operation is not guaranteed.
   - The AnS series special function module is mounted to the A1ADP-XY.
   - The AnS series I/O module is mounted to the A1ADP-SP.
2) Refer to "A-A1S Module Conversion Adapter User's Manual" for the CPU module with which the A1ADP can be used and the base unit to which the A1ADP can be mounted.

5.5.2 Modules which can use the A-A1S module conversion adapter (A1ADP)

The following table shows the modules which can be mounted to the base unit using A-A1S module conversion adapter (A1ADP).

Product	Model	Mounting to the A1ADP			Applicable adapter
		QCPU	QnACPU	ACPU	
Input module	A1SX10	○			XY
	A1SX10EU	○			XY
	A1SX20	○			XY
	A1SX20EU	○			XY
	A1SX30	○			XY
	A1SX40	○			XY
	A1SX40-S1	○			XY
	A1SX40-S2	○			XY
	A1SX41	○			XY
	A1SX41-S1	○			XY
	A1SX41-S2	○			XY
	A1SX42	○			XY
	A1SX42-S1	○			XY
	A1SX42-S2	○			XY
	A1SX71	○			XY
	A1SX80	○			XY
	A1SX80-S1	○			XY
	A1SX80-S2	○			XY
	A1SX81	○			XY
	A1SX81-S2	○			XY
	A1SX82-S1	○			XY
Output module	A1SY10	○			XY
	A1SY10EU	○			XY
	A1SY14EU	○			XY
	A1SY18A	○			XY
	A1SY18AEU	○			XY
	A1SY22	○			XY
	A1SY28A	○			XY
	A1SY40	○			XY
	A1SY40P	○			XY
	A1SY41	○			XY
	A1SY41P	○			XY
	A1SY42P	○			XY
	A1SY50	○			XY
	A1SY60	○			XY
	A1SY60E	○			XY
	A1SY68A	○			XY
	A1SY71	○			XY
	A1SY80	○			XY
	A1SY81	○			XY
	A1SY82	○			XY

Mounting to the A1ADP column ○: Mountable ×: Not mountable –: Out of the target
Applicable adapter column XY: A1ADP-XY SP: A1ADP-SP

Product	Model	Mounting to the A1ADP			Applicable adapter
		QCPU	QnACPU	ACPU	
I/O module	A1SH42		○		XY
	A1SH42P		○		XY
	A1SH42-S1		○		XY
	A1SH42P-S1		○		XY
	A1SX48Y58		○		XY
	A1SX48Y18		○		XY
	A1SJ-56DR		×		–
	A1SJ-56DT		×		–
Dynamic scan input module	A1S42X		○		XY
Dynamic output module	A1S42Y		○		XY
Dummy module	A1SG62		○		XY
Blank cover	A1SG60		○		XY/SP
Interrupt module	A1SI61		○		XY*1
Power supply module	A1S61PN		×		–
	A1S62PN		×		–
	A1S63P		×		–
Pulse catch module	A1SP60		○		XY
Analog timer module	A1ST60		○		XY
Analog input module	A1S64AD		○		SP
	A1S68AD		○		SP
Analog output module	A1S62DA		○		SP
	A1S68DAI		○		SP
	A1S68DAV		○		SP
Analog I/O module	A1S63ADA		○		SP
	A1S66ADA		○		XY
Temperature input module	A1S62RD3N		○		SP
	A1S62RD4N		○		SP
	A1S68TD		○		SP
Temperature control module	A1S62TCTT-S2		○		SP
	A1S62TCTTBW-S2		○		SP
	A1S62TCRT-S2		○		SP
	A1S62TCRTBW-S2		○		SP
	A1S64TCTT-S1		○		SP
	A1S64TCTTBW-S1		○		SP
	A1S64TCRT-S1		○		SP
	A1S64TCRTBW-S1		○		SP
	A1S64TCTRT		○		SP
	A1S64TCTRTBW		○		SP
High-speed counter module	A1SD61		○		SP
	A1SD62		○		SP
	A1SD62E		○		SP
	A1SD62D		○		SP
	A1SD62D-S1		○		SP
Positioning module	A1SD70		×		–
	A1SD75M1		○		SP
	A1SD75M2		○		SP
	A1SD75M3		○		SP
	A1SD75P1-S3		○		SP
	A1SD75P2-S3		○		SP
	A1SD75P3-S3		○		SP
Position detection module	A1S62LS*2		○		SP
Intelligent communication module	A1SD51S		○		SP

Mounting to the A1ADP column ○: Mountable ×: Not mountable –: Out of the target
Applicable adapter column XY: A1ADP-XY SP: A1ADP-SP

Product	Model	Mounting to the A1ADP			Applicable adapter
		QCPU	QnACPU	ACPU	
Ethernet module	A1SJ71E71N-B2	×	○	○	SP
	A1SJ71E71N-B5	×	○	○	SP
	A1SJ71E71N3-T	×	○	○	SP
	A1SJ71QE71N-B2	×	○	×	SP
	A1SJ71QE71N-B5	×	○	×	SP
	A1SJ71QE71N3-T	×	○	×	SP
Serial communication module	A1SJ71QC24N	×	○	×	SP
	A1SJ71QC24N-R2	×	○	×	SP
	A1SJ71QC24N1	×	○	×	SP
	A1SJ71QC24N1-R2	×	○	×	SP
MELSECNET/B data link module	A1SJ71AT21B	×	○	○	SP
	A1SJ72T25B	×			–
MELSECNET data link module	A1SJ71AP21	×	○	○	SP
	A1SJ71AR21	×	○	○	SP
MELSECNET, MELSECNET/B local station data link module	A1SJ71AP23Q	○	×	×	SP
	A1SJ71AR23Q	○	×	×	SP
	A1SJ71AT23BQ	○	×	×	SP
CC-Link master/local module	A1SJ61BT11	×	×	○	SP
	A1SJ61QBT11	×	○	×	SP
MELSECNET/MINI-S3 master module*3	A1SJ71PT32-S3	○			SP
MELSEC-I/O LINK master module	A1SJ51T64	○			SP
B/NET interface module	A1SJ71B62-S3	○			SP
Computer link module	A1SJ71UC24-R2	×	○	○	SP
	A1SJ71UC24-PRF	×	○	○	SP
	A1SJ71UC24-R4	○*4	○	○	SP
S-LINK master module	A1SJ71SL92N	○			SP
AS-i master module	A1SJ71AS92	○			SP
PC fault detection module	A1SS91	○			SP*1
Memory card interface module	A1SD59J-S2	○			SP
ID interface module	A1SD35ID1	○			SP
	A1SD35ID2	○			SP
MODBUS module	A1SJ71UC24-R2-S2	○			SP
	A1SJ71UC24-R4-S2	○			SP
Profibus-DP interface module	A1SJ71PB92D	○			SP
	A1SJ71PB93D	○			SP
Profibus-FMS interface module	A1SJ71PB96F	○			SP
DeviceNet master module	A1SJ71DN91	○			SP

Mounting to the A1ADP column ○: Mountable ×: Not mountable –: Out of the target
Applicable adapter column XY: A1ADP-XY SP: A1ADP-SP

*1 Note that the types of I/O assignment module and A-A1S module conversion adapter differ.
*2 When the A1ADP-SP with the A1S62LS mounted is used, available sensor (absocoder) models differ. For available models, refer to the "Type A1S62LS User's Manual".
*3 The A1SJ71PT32-S3 was discontinued on September, 2008.
*4 The adapter is mountable only when the multidrop link function is used.

5.5.3 Precautions for using A-A1S module conversion adapter (A1ADP)

This section explains precautions for using the A-A1S module conversion adapter (A1ADP).

(1) The number of mountable modules per base unit

Up to three modules can be mounted to one base unit. Use modules within the allowable number.

(2) 5VDC internal current consumption

When replacing the A (large type) series module by the AnS (small type) series module, the internal current consumption may increase. At replacement, check that the current consumption of the modules mounted on the base units does not exceed the rated output current of the power supply module used. (Check for internal current consumption of the A-A1S module conversion adapter in (7) Performance specifications.)

(3) Attaching the dustproof cover

Be sure to attach a dustproof cover to prevent a failure or an electric shock caused by foreign matter entering in the module.

(a) AnS (small type) series module

Attach the dustproof cover included in the A-A1S module conversion adapter to the AnS (small type) series module, and mount the module to the A-A1S module conversion adapter.

(b) A (large type) series module

When using the A-A1S module conversion adapter to which A (large type) series module is mounted on the right side, attach the following dustproof cover to the module. (Prepare individually.)

Product	Manufacturer	Quantity	Remarks
A55B, 58B I/O dustproof cover	Mitsubishi Electric System & Service Co., Ltd.	1	Same dustproof cover included in the A52B, A55B, and A58B

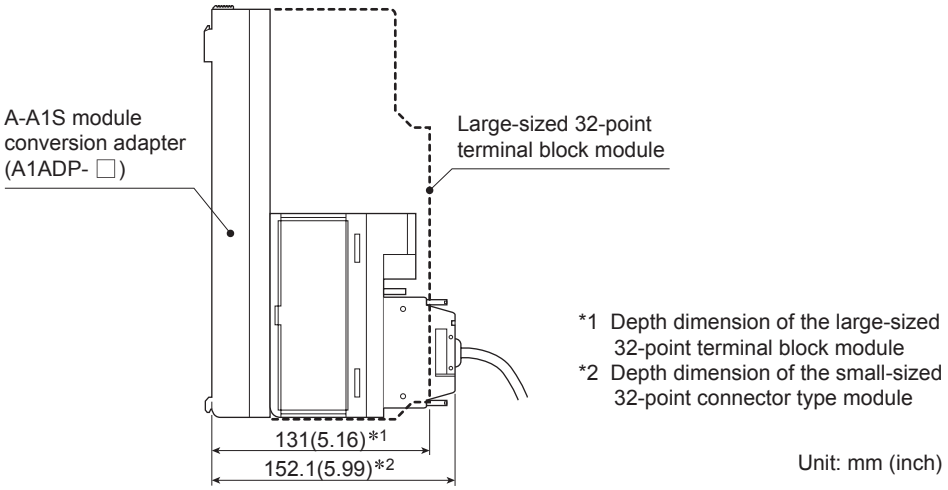
(4) Replacing existing module

The specifications differ between the A (large type) series module and the AnS (small type) series module.
When replacing the A (large type) series module by the AnS (small type) series module, refer to the "Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small Type Series Handbook (L(NA)-08064ENG)" for checking the equivalent products and specifications comparison.

(5) Depth dimension of the AnS (small type) series 32-point I/O connector type module

After replacing the large-sized 32-point terminal block module by the small-sized 32-point connector type module, the depth dimension may increase (refer to the following figure). Check the depth dimension for the installation site.

Comparison of the dimensions between the large-sized 32-point terminal block module and the small-sized 32-point connector type module



(6) Output module with a fuse

The AnS (small type) series output module with a fuse detects fuse blown if external power supply is not input.
Use special relay M9084 (error check) at power-on with the external power supply OFF so that fuse blown may not be detected.

(7) Performance specifications

The following table shows performance specifications of the A-A1S module conversion adapter (A1ADP).

Item	Model	
	A1ADP-XY	A1ADP-SP
5 VDC internal current consumption	3.4mA	0mA
External dimensions	250mm(H) × 37.5mm(W) × 35.5mm(D) (9.84inch(H) × 1.48inch(W) × 1.40inch(D))	
Weight	0.2kg	
Supplied part	Dustproof cover for the AnS (small type)series module	

5.6 Q Series Large Type Base Unit and Q Series Large Type I/O Module

When replacing the A/QnA series CPU module by the Q series CPU module using the Q series large type base unit and Q series large type I/O module, 32-point terminal block used for the A/QnA series can be attached without change. (Wiring change is unnecessary).

5.6.1 Specifications

(1) Q series large type base unit

Item		Product/model				
		Q series large type main base unit		Q series large type extension base unit		
				(With power supply)		(Without power supply) *1
		Q35BL	Q38BL	Q65BL	Q68BL	Q55BL
Number of mountable I/O modules		5	8	5	8	5
Extendability		Mounting additional stages is possible.				
Applicable module		Q series module, Q series large type I/O module				
5VDC internal current consumption		0.11A	0.12A	0.11A	0.12A	0.10A
External dimensions	H	240mm				
	W	382mm	480mm	352mm	466mm	297mm
	D	110mm				
Weight		1.87kg	2.35kg	1.81kg	2.32kg	1.59kg
DIN rail installation		Cannot be installed.				

*1 The A58B cannot be replaced by the Q series large type extension base unit. Replace it by the Q68BL.

(2) QX11L type AC input module (specifications comparison with AX11)

Specifications		AX11 (AC input module)	QX11L (AC input module)
Number of input points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated input voltage, frequency		100 to 120VAC 50/60Hz	100 to 120VAC (+10/-15%) 50/60Hz (±3Hz)
Input voltage distortion factor		Within 5%	Within 5%
Rated input current		10mA (100VAC, 60Hz)	10mA (100VAC,60Hz)
Operating voltage range		85 to 132VAC (50/60Hz±5%)	85 to 132VAC (50/60Hz±5%)
Maximum number of simultaneous input points		60% (20 points) simultaneously ON	60% (20 points)simultaneously ON
Inrush current		Max.300mA Within 0.3ms (at 132VAC)	Max.300mA Within 0.3ms (at 132VAC)
ON voltage/ON current		80VAC or more/6mA or more	80VAC or more/6mA or more
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/2mA or less
Input impedance		Approx.10kΩ (60Hz), Approx.12kΩ (50Hz)	Approx.10kΩ (60Hz), Approx.12kΩ (50Hz)
Response time	OFF to ON	15ms or less	15ms or less
	ON to OFF	25ms or less	25ms or less
Dielectric withstand voltage		1500VAC for 1 minute	1780VAC rms/3 cycles (elevation 2000m(6561.7ft.))
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: TB9, TB18, TB27, TB36)
Operation indication		ON indication (LED)	ON indication (LED)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		110mA (TYP. all points ON)	75mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.49kg	0.33kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(3) QX21L type AC input module (specifications comparison with AX21)

Specifications		AX21 (AC input module)	QX21L (AC input module)
Number of input points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated input voltage, frequency		200 to 240VAC 50/60Hz	200 to 240VAC (+10/-15%) 50/60Hz (±3Hz)
Input voltage distortion factor		Within 5%	Within 5%
Rated input current		10mA (220VAC, 60Hz)	10mA (220VAC, 60Hz)
Operating voltage range		170 to 264VAC (50/60Hz±5%)	170 to 264VAC (50/60Hz±5%)
Maximum number of simultaneous input points		60% (20 points) simultaneously ON	60% (20 points) simultaneously ON (at 264VAC, 55°C) 100% (32 points) simultaneously ON (at 264VAC, 45°C)
Inrush current		Max.600mA Within 0.12ms (at 264VAC)	Max.600mA Within 0.12ms (at 264VAC)
ON voltage/ON current		160VAC or more/5.5mA or more	160VAC or more/5.5mA or more
OFF voltage/OFF current		70VAC or less/3.5mA or less	70VAC or less/3.5mA or less
Input impedance		Approx.22kΩ (60Hz), Approx.24kΩ (50Hz)	Approx.22kΩ (60Hz), Approx.27kΩ (50Hz)
Response time	OFF to ON	15ms or less	15ms or less
	ON to OFF	25ms or less	25ms or less
Dielectric withstand voltage		1500VAC for 1 minute	1500VAC for 1 minute
Common terminal arrangement		32 points/common (Common terminal: TB9, TB18, TB27, TB36)	32 points/common (Common terminal: TB9, TB18, TB27, TB36)
Operation indication		ON indication (LED)	ON indication (LED)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		110mA (TYP. all points ON)	75mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.50kg	0.33kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(4) QY11AL type contact output module (specifications comparison with AY10A)

Specifications		AY10A (contact output module)	QY11AL (contact output module)
Number of output points		16 points	16 points
Insulation method		Photocoupler	Photocoupler
Rated switching voltage/ current		24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 16A/total	24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 16A/total
Minimum switching load		5VDC 1mA	5VDC 1mA
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC
Leakage current at OFF		–	0.1mA (at 200VAC 60Hz)
Response time	OFF to ON	10ms or less	10ms or less
	ON to OFF	12ms or less	12ms or less
Life	Mechanical	20 million times or more	20 million times or more
	Electrical	Rated switching voltage/current load 200,000 times or more	Rated switching voltage/current load 200,000 times or more
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more
		200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200,000 times or more	200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200,000 times or more
		24VDC 1A,100VDC 0.1A (L/R=7ms) 200,000 times or more	24VDC 1A,100VDC 0.1A (L/R=7ms) 200,000 times or more
Maximum switching frequency		3600 times/hr	3600 times/hr
Surge suppressor		None	Varistor (387 to 473V)
Dielectric withstand voltage		1500VAC for 1 minute	1500VAC for 1 minute
Relay socket		None	None
Common terminal arrangement		Not provided (all points independent)	All points independent
Operation indication		ON indication (LED)	ON indication (LED)
External power supply	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less
	Current	150mA (TYP. 24VDC all points ON)	150mA (TYP. 24VDC all points ON)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		115mA (TYP. all points ON)	130mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.50kg	0.38kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(5) QY11AL type contact output module (specifications comparison with AY11A)

Specifications		AY11A (contact output module)	QY11AL (contact output module)
Number of output points		16 points	16 points
Insulation method		Photocoupler	Photocoupler
Rated switching voltage/ current		24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 16A/total	24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 16A/total
Minimum switching load		5VDC 1mA	5VDC 1mA
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC
Leakage current at OFF		0.1mA (at 200VAC 60Hz)	0.1mA (at 200VAC 60Hz)
Response time	OFF to ON	10ms or less	10ms or less
	ON to OFF	12ms or less	12ms or less
Life	Mechanical	20 million times or more	20 million times or more
	Electrical	Rated switching voltage/current load 200,000 times or more	Rated switching voltage/current load 200,000 times or more
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more
		200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200,000 times or more	200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200,000 times or more
		24VDC 1A,100VDC 0.1A (L/R=7ms) 200,000 times or more	24VDC 1A,100VDC 0.1A (L/R=7ms) 200,000 times or more
Maximum switching frequency		3600 times/hr	3600 times/hr
Surge suppressor		Varistor (387 to 473V)	Varistor (387 to 473V)
Dielectric withstand voltage		1500VAC for 1 minute	1500VAC for 1 minute
Relay socket		None	None
Common terminal arrangement		Not provided (all points independent)	All points independent
Operation indication		ON indication (LED)	ON indication (LED)
External power supply	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less
	Current	150mA (TYP. 24VDC all points ON)	150mA (TYP. 24VDC all points ON)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		115mA (TYP. all points ON)	130mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.47kg	0.38kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(6) QY13L type contact output module (specifications comparison with AY13)

Specifications		AY13 (contact output module)	QY13L (contact output module)
Number of output points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated switching voltage/ current		24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 5A/common	24VDC 2A (Resistance load)/point 240VAC 2A (COSϕ=1)/point 5A/common
Minimum switching load		5VDC 1mA	5VDC 1mA
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC
Response time	OFF to ON	10ms or less	10ms or less
	ON to OFF	12ms or less	12ms or less
Life	Mechanical	20 million times or more	20 million times or more
	Electrical	Rated switching voltage/current load 200,000 times or more	Rated switching voltage/current load 200,000 times or more
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200,000 times or more
		200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35)200,000 times or more	200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35)200,000 times or more
		24VDC 1A,100VDC 0.1A (L/R=7ms)200,000 times or more	24VDC 1A,100VDC 0.1A (L/R=7ms)200,000 times or more
Maximum switching frequency		3600 times/hr	3600 times/hr
Surge suppressor		None	None
Dielectric withstand voltage		1500VAC for 1 minute	1500VAC for 1 minute
Relay socket		None	None
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	8 points/common (Common terminal: TB9, TB18, TB27,TB36)
Operation indication		ON indication(LED)	ON indication(LED)
External power supply	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less
	Current	290mA (TYP. 24VDC all points ON)	290mA (TYP. 24VDC all points ON)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		230mA (TYP. all points ON)	230mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.59kg	0.45kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(7) QY23L type triac output module (specifications comparison with AY23)

Specifications		AY23 (triac output module)	QY23L (triac output module)
Number of output points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated load voltage		100 to 240VAC 40 to 70Hz	100 to 240VAC(+10/-15%)
maximum load voltage		264VAC	264VAC
Maximum load current		0.6A/point, 2.4A/common*1 (1.05A/common)	0.6A/point, 2.4A/common
Minimum load voltage/current		24VAC 100mA,100VAC 10mA, 240VAC 10mA	24VAC 100mA,100VAC 10mA, 240VAC 10mA
Maximum inrush current		20A 10ms or less, 8A 100ms or less	20A 10ms or less, 8A 100ms or less
Leakage current at OFF		1.5mA (120VAC 60Hz), 3mA (240VAC 60Hz)	1.5mA (120VAC 60Hz), 3mA (240VAC 60Hz)
Maximum voltage drop at ON		1.5VAC or less (100 to 600mA), 1.8VAC or less (50 to 100mA), 2VAC or less (10 to 50mA)	1.5VAC or less (100 to 600mA), 1.8VAC or less (50 to 100mA), 2VAC or less (10 to 50mA)
Response time	OFF to ON	1ms	1ms or less
	ON to OFF	1ms+0.5 cycle or less	1ms+0.5 cycle or less
Surge suppressor		CR absorber (0.022μF+47Ω)	CR absorber (0.022μF+47Ω)
Fuse rating		Fast blow fuse 3.2A (1 fuse/common) HP-32	Fast blow fuse 3.2A (1 fuse/common) HP-32
Fuse blown indication		Available (LED turns on by fuse blown, and a signal is output to the CPU module.)	Available (LED turns on by fuse blown, and a signal is output to the CPU module.)
Dielectric withstand voltage		1500VAC for 1 minute	1500VAC for 1 minute
Common terminal arrangement		8 points/common (Common terminal: TB9, TB18, TB27, TB36)	8 points/common (Common terminal: TB9, TB18, TB27, TB36)
Operation indication		ON indication(LED)	ON indication(LED)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-31.25-3, RAV2-3	R1.25-3, R2-31.25-32-3, RAV2-3
5VDC internal current consumption		590mA (TYP. all points ON)	590mA (TYP. all points ON)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*2 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.55kg	0.45kg

*1 When used at next to the power supply module, the maximum load current becomes the value in ( ).

*2 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(8) QY51PL transistor output module (specifications comparison with AY51)

Specifications		AY51 (transistor output module)	QY51PL (transistor output module)
Number of output points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated load voltage		12/24VDC	12/24VDC
maximum load voltage		10.2 to 30VDC	10.2 to 28.8VDC
Maximum load current		0.5A/point, 4A/common (When mounted next to the power supply module: 3.3A/common)	0.5A/point, 4A/common
Maximum inrush current		4A 10ms or less	No limit (Short protection function)
Leakage current at OFF		0.1mA or less	0.1mA or less
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	0.2VDC (TYP.) 0.5A 0.3VDC (MAX.) 0.5A
Response time	OFF to ON	2ms or less	0.5ms or less
	ON to OFF	2ms or less (Resistance load)	1ms or less (Resistance load)
Surge suppressor		Varistor (52 to 62V)	Zener diode
Common terminal arrangement		16 points/common (Common terminal: TB18, TB36)	16 points/common (Common terminal: TB18, TB36)
Protection function		None	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.
Operation indication		ON indication (LED)	ON indication (LED)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 28.8VDC)
	Current	50mA (TYP. 24VDC 1 common)	8mA (TYP. 24VDC 1 common)
5VDC internal current consumption		230mA (TYP. all points On)	100mA (TYP. all points On)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.53kg	0.28kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(9) QY51PL transistor output module (specifications comparison with AY51-S1)

Specifications		AY51-S1 (transistor output module)	QY51PL (transistor output module)
Number of output points		32 points	32 points
Insulation method		Photocoupler	Photocoupler
Rated load voltage		12/24VDC	12/24VDC
maximum load voltage		10.2 to 30VDC	10.2 to 28.8VDC
Maximum load current		0.3A/point, 2A/common (1A/fuse common)	0.5A/point, 4A/common
Maximum inrush current		3A 10ms or less	No limit (Short protection function)
Leakage current at OFF		0.1mA or less	0.1mA or less
Maximum voltage drop at ON		1VDC (TYP.) 0.3A 1.5VDC (MAX.) 0.3A	0.2VDC (TYP.) 0.5A 0.3VDC (MAX.) 0.5A
Response time	OFF to ON	2ms or less	0.5ms or less
	ON to OFF	2ms or less (Resistance load)	1ms or less (Resistance load)
Surge suppressor		Transistor built-in zener diode	Zener diode
Common terminal arrangement		16 points/common (Common terminal: TB18, TB36) 8 points/fuse common	16 points/common (Common terminal: TB18, TB36)
Protection function		None	Yes (overheat protection function, overload protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.
Fuse		1A fast blow fuse (2 fuses per common in units of 8 points) MP-10	None
Fuse blow indicator		Yes (LED is turned ON when fuse is blown. Signal is output to a programmable controller CPU.)	None
Operation indication		ON indication (LED)	ON indication (LED)
External connection method		38-point terminal block connector (M3 × 6 screws)	38-point terminal block connector (M3 × 6 screws)
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)	0.75 to 2mm^2 (Applicable tightening torque 0.68N•m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R2-3, RAV1.25-3, RAV2-3
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 28.8VDC)
	Current	100mA (TYP. 24VDC 1 common)	8mA (TYP. 24VDC 1 common)
5VDC internal current consumption		310mA (TYP. all points On)	100mA (TYP. all points On)
External dimensions		250(H) × 37.5(W) × 131(D)mm (9.84(H) × 1.48(W) × 5.16(D)inch)	220(H) × 37.5(W) × 116.5(D)mm*1 (8.66(H) × 1.48(W) × 4.59(D)inch)
Weight		0.55kg	0.28kg

*1 Indicates the depth dimension (D) when 38-point terminal block connector is not attached.

(10)Q series large type blank cover

The cover is for filling a gap between the large type base unit and existing Q series module.

Item	Model
	QG69L
External dimensions	108(H) × 37.5(W) × 54(D)mm (4.25(H) × 1.48(W) × 2.13(D)inch)
Weight	0.03kg

5.6.2 Applicable programmable controller

The following modules are mountable to the CPU slot on the Q series large type base unit. (The Basic model QCPU, Process CPU, Redundant CPU, and safety CPU are not mountable.)

- High Performance model QCPU
- Universal model QCPU (except for Q00UJCPU)
- MELSECNET/H remote I/O module

5.6.3 Modules that cannot be mounted on the Q series large type base unit

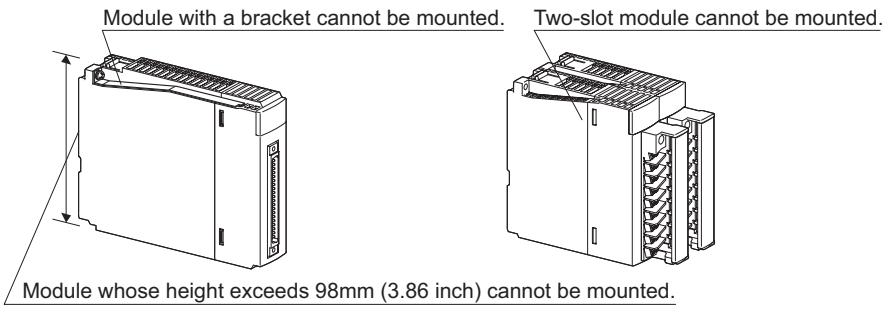
(1) Two-slot module

Example Such as Q64TCRTBW, Q64TCTTBW, QD70D4, QD70D8, QJ71LP21S-25, and QJ71GP21S-SX

(2) Module on which the Q series large type black cover cannot be attached

- Module whose height exceeds 98mm (3.86 inch)
- Module with a bracket on its top
- Module on which the Q7BAT-SET has been mounted

Example Module on which the Q66AD-DG, Q66DA-G, or Q68AD-G has been mounted; or the QJ71WS96 on which the Q7BAT-SET has been mounted



Point

(1) Use the extension cable connected to existing Q series for connecting the power supply module, CPU module, and Q series large type base unit.
(Attaching the Q series large type black cover to the power supply module or CPU module is unnecessary.)

(2) The upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.) can be mounted to the Q series large type base unit. (Attaching the Q series large type black cover to the upgrade tool is necessary.)
The I/O module of terminal block type, except for the Q series large type I/O module, can be replaced without wiring change.

5.6.4 Precautions for using the Q series large type base unit and large type I/O module

(1) 32-point terminal block for I/O module

The Q series large type I/O module does not include 32-point terminal block.
To use the Q series large type I/O module in a new system, purchase the following MELSEC-A series 32-point terminal block separately.

Product	Model	Manufacturer	Contact
MELSEC-A series 32-point terminal block	K14K 08H 075 000 03	Mitsubishi Electric System & Service Co., Ltd.	Refer to the end of Section 1.2.3

(2) Relay terminal block for power supply wiring

When wiring to the terminal block on the power supply module mounted on the Q series large type base unit cannot be made by using wiring to the power supply module used for the A/QnA series, purchase relay terminal block separately to relay the wiring to the power supply module.
For relay terminal block, refer to the following manual.

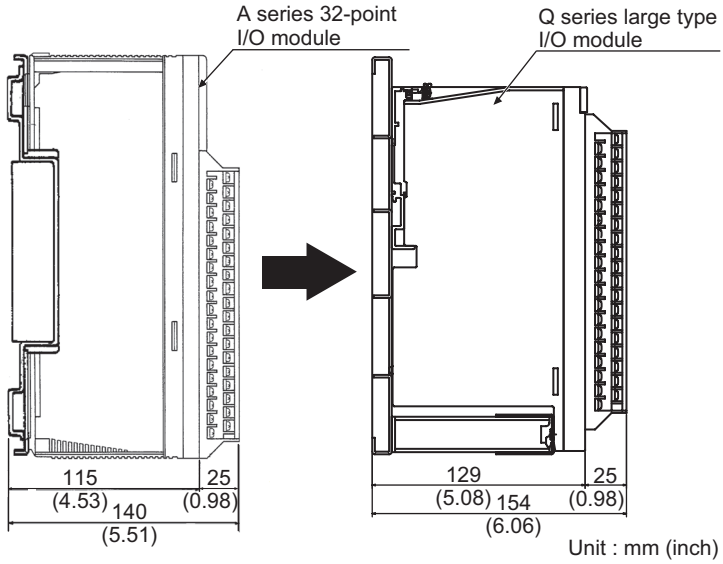
Q Series Large Type Base Unit/I/O Module/Blank Cover User's Manual

(3) Attaching the Q series large type blank cover

To mount the Q series module on Q series large type base unit, always attach the Q series large type blank cover. (unnecessary for a module mounted on CPU slot and power supply module.)

(4) Mounting dimensions of the Q series large type I/O module

The Q series large type I/O module is larger than A series 32-point I/O module in depth by 14mm (0.55 inch). Before replacing the A/QnA series, check if there is enough space for depth.



(5) Rated output current of the power supply module

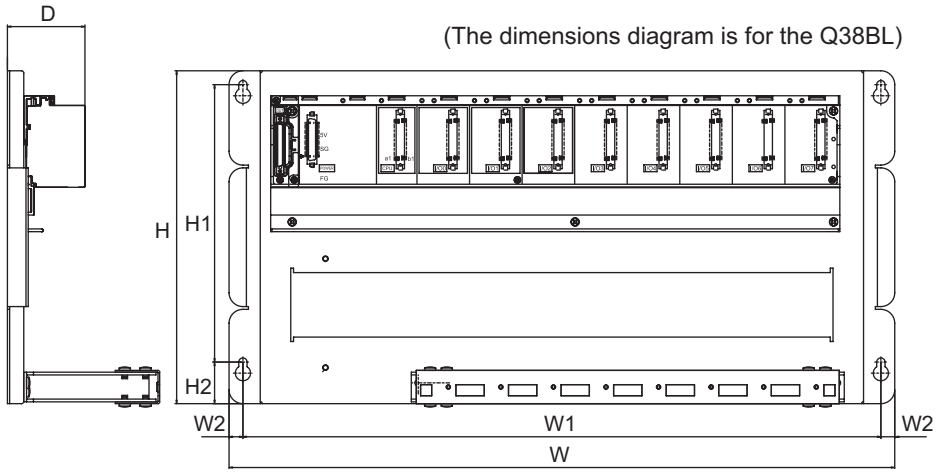
The A series and Q series differ in rated output current of power supply module (24VDC).
When output current of the power supply module is used as external power supply of I/O module, another external power supply may be required in replacement from the A series.

(6) Compatibility with the multiple CPU system

When a Q series large main base unit is used, a multiple CPU system cannot be configured. (The Q series large type extension base unit can be used in a multiple CPU system.)

5.6.5 External dimensions

(1) Q series large type base unit

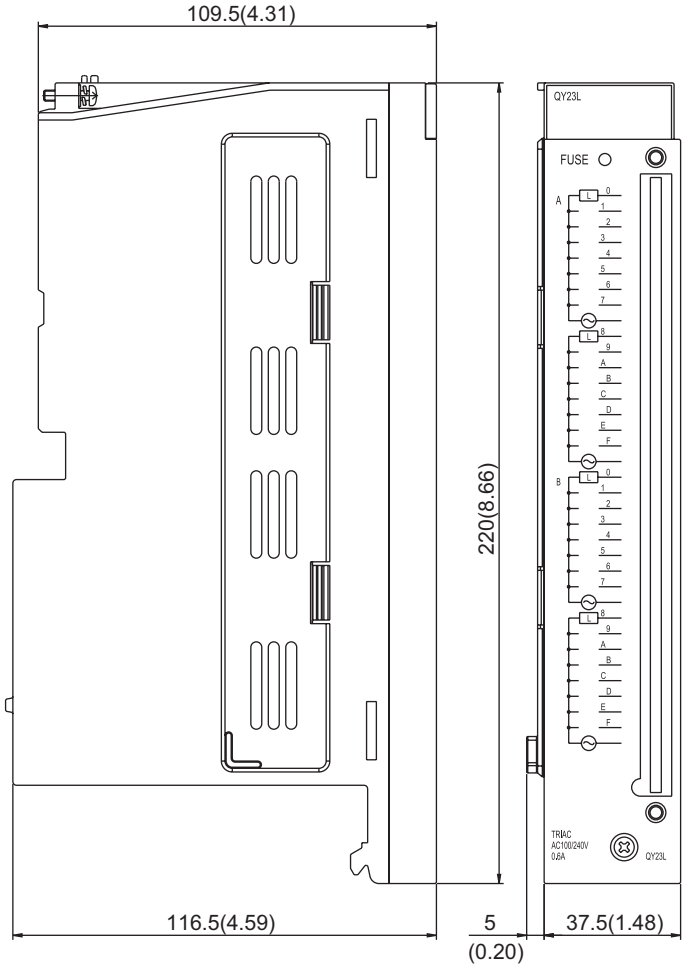


Q series large type base unit	Dimensions			Mounting dimensions			
	H	W	D*1	H1	H2	W1	W2
Q35BL	240 (9.49)	382(15.04)	56 (2.20)	200 (7.87)	30 (1.18)	362(14.25)	10 (0.39)
Q38BL		480(18.90)				460(18.11)	
Q65BL		352(13.86)				332(13.07)	
Q68BL		466(18.37)				446(17.56)	
Q55BL		297(11.69)				277(10.91)	

(Unit: mm(inch))

*1 Depth dimension when each module is mounted depends on the mounted module. Check the external dimensions of the module.

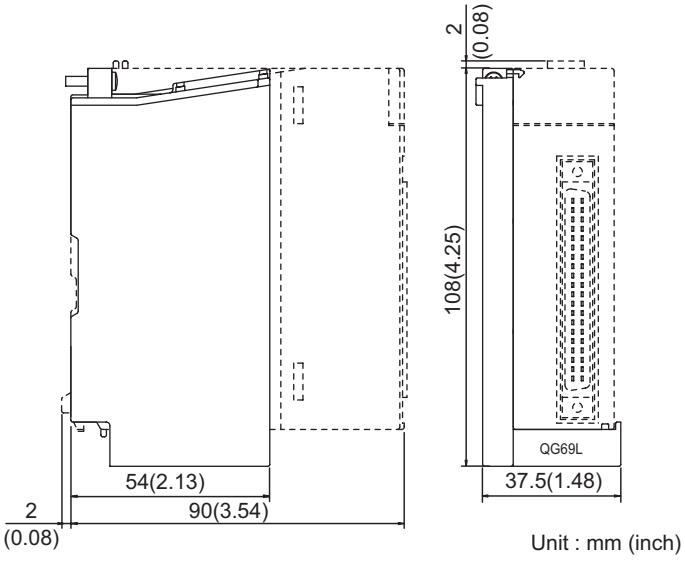
(2) Q series large type I/O module (QX11L, QX21L, QY11AL, QY13L, QY23L, QY51PL)*1



Unit : mm (inch)

*1 The external dimensions of the Q series large type I/O module are that of individual module.
Refer to Section 5.6.4 (4) for dimensions and precautions when mounting to Q series large type base unit.

(3) Q series large type blank cover (QG69L)



Unit : mm (inch)

6 MEMORY AND BATTERY REPLACEMENT

6.1 List of Alternative Models for Memory

A/QnA series models to be discontinued		Q series alternative models	
Product	Model	Model	Remarks (restrictions)
Memory cassette	A3NMCA-0	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-2	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-4	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-8	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-16	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-24	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-40	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3NMCA-56	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A3AMCA-96	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A4UMCA-128	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A4UMCA-8E	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A4UMCA-32E	Unnecessary	Built-in RAM and built-in flash ROM are alternative
	A4UMCA-128E	Unnecessary	Built-in RAM and built-in flash ROM are alternative
IC-RAM memory	4KRAM	Unnecessary	Built-in RAM is alternative
EP-ROM memory	4KEROM	Unnecessary	Built-in flash ROM is alternative
	32KROM	Unnecessary	Built-in flash ROM is alternative
	64KROM	Unnecessary	Built-in flash ROM is alternative

6.2 Precautions for Memory and Battery Replacement

(1) Precaution for memory replacement

(a) The Q series does not need memory cassettes, since its CPU module incorporates the built-in RAM/flash ROM.
This built-in flash ROM in the CPU module enables the ROM operation (Boot run).

(b) When using multiple blocks of extension file registers or sampling trace function for the Q series, the SRAM card for the series is required.

(2) Precaution for battery replacement

The battery for the A series (A6BAT*) should be replaced with the one for Q series (Q6BAT, Q7BAT). Refer to the users manual of each CPU module for battery life, since it varies depending on the type of CPU module and memory cassette.

* The A6BAT is not a model to be discontinued.

7 PROGRAM REPLACEMENT

This chapter explains how to replace (reuse) the programs and comments of the A and QnA series CPU with the Q series, and precautions for the replacement.

(1) Comparisons between ACPU and QCPU

○: Compatible, △:Partial change required, ×: Incompatible

Item		ACPU specification	QCPU specification and precautions for replacement	Compat-ibility	Refer to
Sequence program	Main Sub 1 Sub 2 Sub 3 SFC	• Main program is required. • Sub programs, if included, are switched with the CHG instructions. • The SFC is dealt as the microcomputer program of main program.	[Specification] • Each program is dealt as one file. [Measure] • Execute the file setting of PLC parameter.	△	Section 7.7.10
Microcomputer program		• A user-created microcomputer program and the microcomputer program of the utility package are available.	[Specification] • Creating microcomputer program is not applicable. [Measure] • Replacing the ACPU user-created microcomputer program with sequence program since the microcomputer program execution is not applicable. • For utility packages instructions, correct them equivalent to the corresponding instructions of the QCPU.	×	–
Instruction		• Dedicated instructions for the ACPU (LED instruction, etc.) are available.	[Specification] • With “Change PLC type”, instructions are converted automatically except some instructions. [Measure] • Correct a program since some instructions are converted to SM1255 and SD1255 (Basic model QCPU: SM999 and SD999).	△	Section 7.2
File register		• Storage area is reserved in a memory cassette. • One block is set in 8 k points unit.	[Specification] • Data is stored in a standard RAM or memory card. • One block is set in 32k points unit. [Measure] • Execute the file setting of PLC parameter.	△	Section 7.7.11

○: Compatible, △:Partial change required, ×: Incompatible

Item	ACPU specification	QCPU specification and precautions for replacement	Compat-ibility	Refer to
Timer, Counter	• Timer and counter are processed with the END.	[Specification] • Timer and counter are processed when executing an instruction. [Measure] • Review the programs since the processing timing differs between timer and counter.	△	Section 7.7.4, Section 7.7.5
Parameter	• Parameters are dedicated for each CPU.	[Specification] • Parameters are dedicated for each CPU. [Measure] • Check and re-set the parameters since specifications and functions differ between the two CPUs.	△	Section 7.3
Special relay	• 256 points of M9000 to M9255 are provided.	[Specification] • 1800 points of SM0 to SM1799 are provided. [Measure] • Although automatic conversion is executed for the QCPU replacement, review the points since some specifications differ between the two CPUs.	△	Section 7.4
Special register	• 256 points of D9000 to D9255 are provided.	[Specification] • 1800 points of SD0 to SD1799 are provided. [Measure] • Although automatic conversion is executed for the QCPU replacement, review the points since some specifications differ between the two CPUs.	△	Section 7.5
Comment	• Comments are managed as a common comment or program original comment. • The comment capacity of ACPU is up to 127k (64k + 63k) bytes.	[Specification] • Comments are managed as a common comment or program original comment. • Comments are automatically replaced upon the QCPU conversion. • The comment capacity of the QCPU depends on memory capacity.	○	–
Writing programs to ROM	• The ROM operation is executed with the EP-ROM.	[Specification] • The boot run is executed with programs stored in a standard ROM or memory card upon the QCPU replacement. [Measure] • Execute the boot setting of PLC parameter.	△	Section 7.7.12

(2) Comparison between QnACPU and QCPU

○: Compatible, △:Partial change required, ×: Incompatible

Item	QnACPU specification	QCPU specification and precautions for replacement	Compat-ibility	Refer to
Sequence program SFC program	• Each program is dealt as one file.	[Specification] • Each program is dealt as one file.	○	–
Instruction	• Dedicated instructions as display (LED) instruction, status latch (SLT) instruction, etc. are available.	[Specification] • With "Change PLC type", instructions are converted automatically except some instructions. [Measure] • Correct a program since some instructions are converted to SM1255 and SD1255 (Basic model QCPU: SM999 and SD999).	△	Section 7.2
File register	• Data is stored in a memory card. • One block is set in 32k points unit.	[Specification] • Data is stored in a standard RAM or memory card. • One block is set in 32k points unit. [Measure] • Review the setting since the number of memory cards differs between the two CPUs.	△	Section 7.7.11
Parameter	• Dedicated parameters for each CPU are provided.	[Specification] • Dedicated parameters for each CPU are provided. [Measure] • Check and re-set the parameters since specifications and functions differ between the two CPUs.	△	Section 7.3
Special relay	• 1800 points of SM0 to SM1799 are provided.	[Specification] • 1800 points of SM0 to SM1799 are provided. [Measure] • Review the points since some specifications differ between the two CPUs.	△	Section 7.4
Special register	• 1800 points of SD0 to SD1799 are provided.	[Specification] • 1800 points of SD0 to SD1799 are provided. [Measure] • Review the points since some specifications differ between the two CPUs.	△	Section 7.5
Comment	• Comments are managed as a common comment or program original comment.	[Specification] • Comments are managed as a common comment or program original comment.	○	–
Writing programs to ROM	• The boot run is executed with program and parameter stored in a memory card. • Up to two memory cards can be installed.	[Specification] • The boot run is executed with the programs stored in a standard ROM or memory card upon QCPU replacement. • One memory card can be installed. [Measure] • Execute the boot setting of PLC parameter.	△	Section 7.7.12

7.1 Program Replacement Procedure

The programs and comments of the A and QnA series CPU can be replaced with the Q series by "Change PLC type" of GX Developer.

7.1.1 Program conversion procedure from ACPU to QCPU

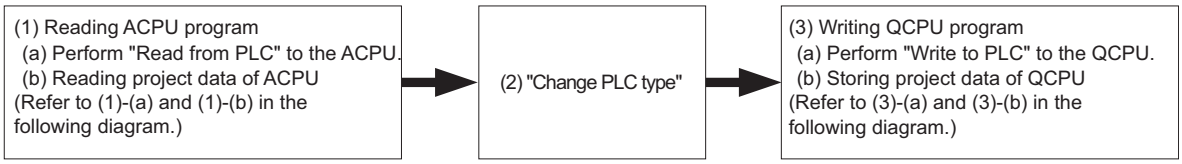
Program conversion procedure follows the order of (1) → (2) → (3) below.

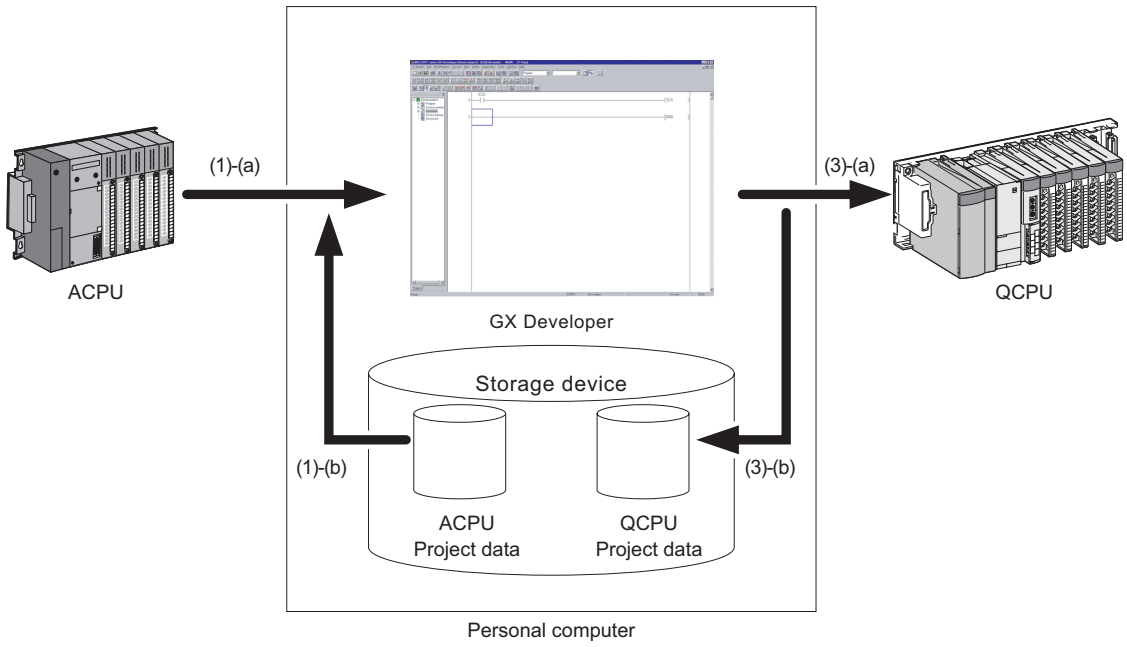
(1) Reading process of conversion source data.

(2) Program conversion from ACPU to QCPU with “Change PLC type”.

(3) Writing process of converted data.

Refer to Section 7.1.2 for details of the change operation.





7.1.2 Changing programmable controller type

"Change PLC type" is a function that changes the target programmable controller type of the data read to GX Developer.
Some instructions which are not converted automatically are converted to OUT SM1255 (Basic model QCPU: SM999). Search for these instructions or SM1255/SM999 in the converted program and modify the program manually.
For intelligent function modules and network modules, review programs and parameters.

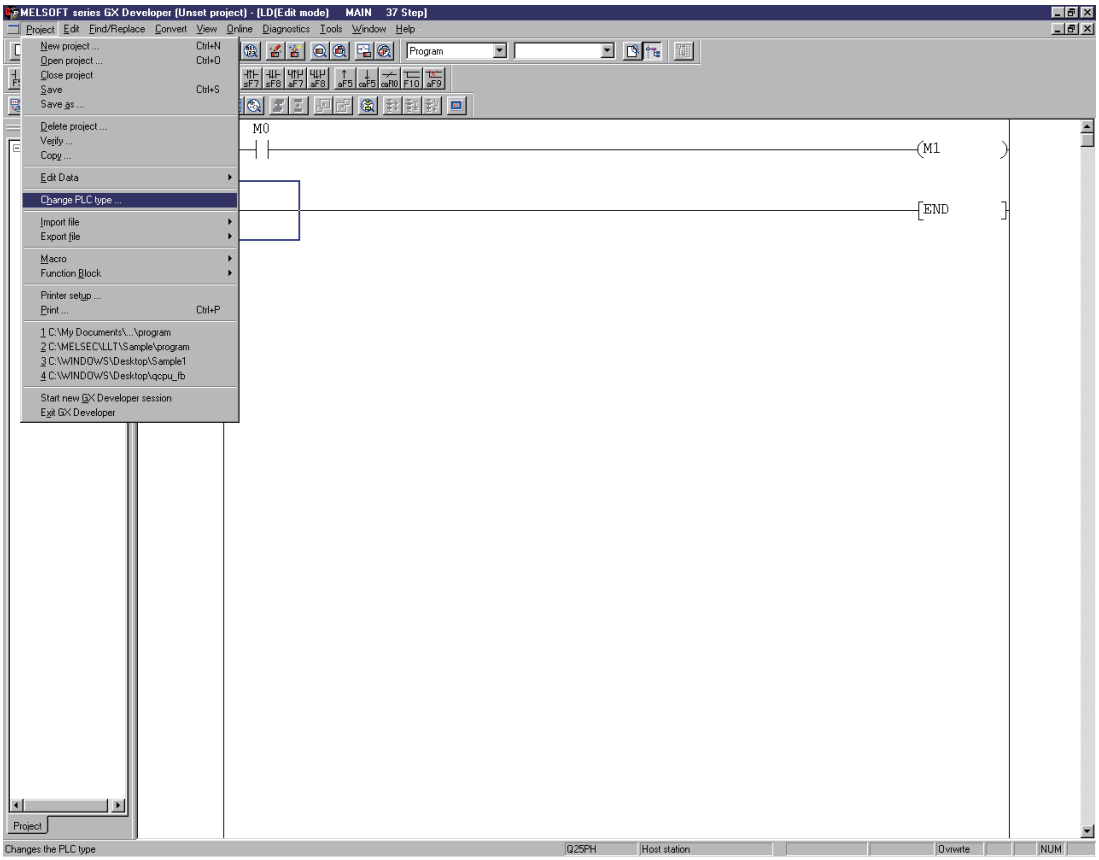
(1) Applicable range of conversion from ACPU by GX Developer

The following table shows the applicable range of conversion from the ACPU to other programmable controllers. As it shows, converting to any type of CPU module is possible.

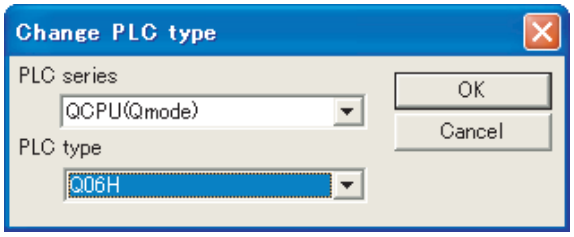
Product	Change source programmable controller	Change destination programmable controller		
		ACPU	QnACPU	QCPU
GX Developer	ACPU	○	○	○

(2) Operation of GX Developer

(a) Select "Change PLC type" of the "Project" menu.

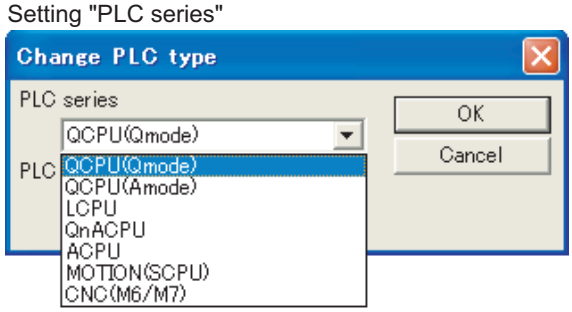


(b) Specify the target programmable controller type in the "Change PLC type" dialog.

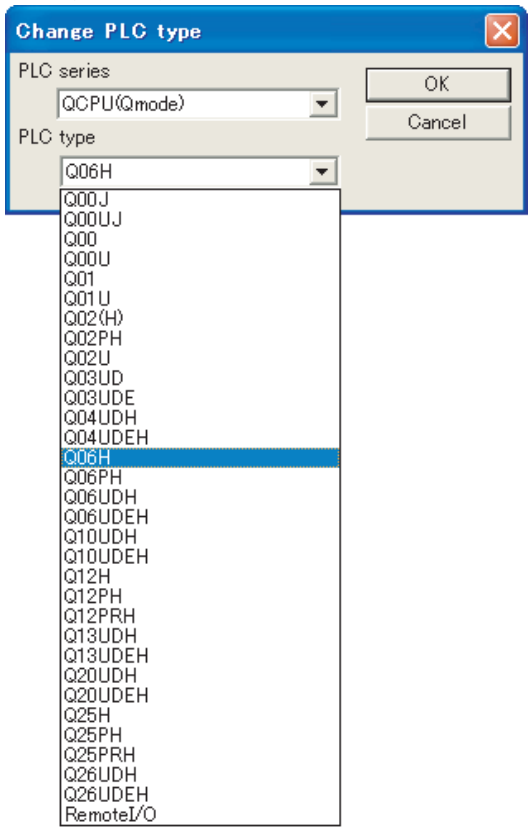


Click the [OK] button after setting "PLC type".

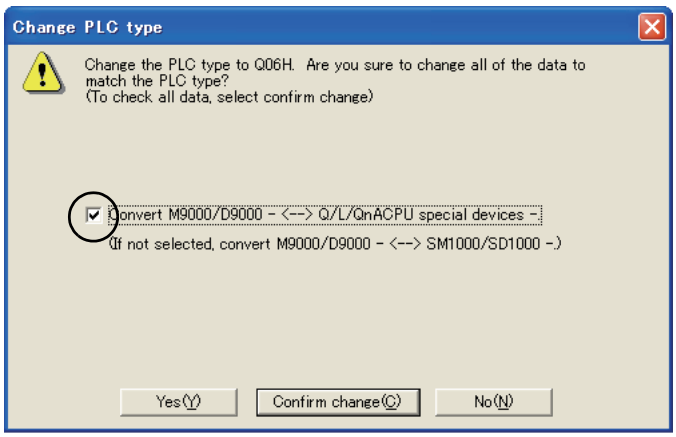
Setting "PLC series"



Setting "PLC type"



(c) Select the conversion method of special relays/registers.



Specify the conversion destination of special relays/registers (ACPU:M9000s/D9000s).
Check the [Convert M9000/D9000←→Q/QnACPU special devices]

- Checked: Converted to the Q dedicated device.
- Not Checked: Converted to the A compatible (SM1000s/SD1000s).

When the Basic model QCPU or Universal model CPU is selected, the parameter is always checked.
It is recommended to check the box when specifying the device conversion destination.

Click the [Yes] or [Confirm change] button after specifying the device conversion destination to start "Change PLC type".

- [Yes] : The change is executed without intermediate steps of user confirmation.
- [Confirm change] : Asks the user for confirming the changes.

7.1.3 ACPU program conversion ratio

• **Conversion ratio of common instructions (Sequence/basic/application instructions)**

The following table shows the conversion ratio when changing the programmable controller type of the ACPU common instructions to the QCPU.

More than 90% of the common instructions are automatically converted.

Instruction type		Number of instructions	Universal model QCPU High Performance model QCPU		
			Number of instructions applicable for automatic conversion	Number of instructions requiring manual change	Conversion ratio (Average level)
Sequence instruction	Contact instruction	6	6	0	100%
	Connection instruction	5	5	0	100%
	Output instruction	6	5	1	83%
	Shift instruction	2	2	0	100%
	Master control instruction	2	2	0	100%
	Termination instruction	2	2	0	100%
	Other instruction	3	3	0	100%
Total number of sequence instruction		26	25	1	96%
Basic instruction	Comparison operation instruction	36	36	0	100%
	Arithmetic operation instruction	40	40	0	100%
	BCD ↔ BIN conversion instruction	8	8	0	100%
	Data transfer instruction	16	16	0	100%
	Program branch instruction	9	9	0	100%
	Program switching instruction	1	0	1	0%
	Link refresh instruction	2	2	0	100%
Total number of basic instruction		112	111	1	99%
Application instruction	Logical operation instruction	18	18	0	100%
	Rotation instruction	16	16	0	100%
	Shift instruction	12	12	0	100%
	Data processing instruction	20	19	1	95%
	FIFO instruction	4	4	0	100%
	Buffer memory access instruction	8	8	0	100%
	FOR to NEXT instruction	2	2	0	100%
	Local station, remote I/O station Access instruction	4	0	4	0%
	Display instruction	5	3	2	60%
	Other instruction	10	2	8	20%
Total number of application instruction		99	84	15	85%
Total number of sequence/basic/application instruction		237	220	17	93%

• **Conversion ratio of dedicated instructions**

The following table shows the conversion ratio when changing the programmable controller type of the ACPU dedicated instructions to the QCPU.

Instruction type		Number of instructions	Universal model QCPU High Performance model QCPU		
			Number of instructions applicable for automatic conversion	Number of instructions requiring manual change	Conversion ratio (Average level)
Dedicated instruction (Functional extension)	Direct input/output instruction	3	3	0	100%
	Structured program instruction	6	2	4	33%
	Data operation instruction	6	6	0	100%
	I/O operation instruction	2	2	0	100%
	Real number processing instruction	27	27	0	100%
	Character string processing instruction	25	24	1	96%
	Data control instruction	6	6	0	100%
	Clock instruction	2	2	0	100%
	Extension file register instruction	7	0	7	0%
	Program switching instruction	4	0	4	0%
	Instruction for PID control	3	2	1	67%
	Subtotal	91	74	17	81%
Dedicated instruction (For modules)	Instruction for data link	9	5	4	56%
	Instruction for special function modules	59	0	59	0%
	Subtotal	68	5	63	7%
Total number of dedicated instruction		159	79	80	50%

Remarks

The automatic conversion is applied to the instructions of which equivalent functions and instructions exist in the change destination programmable controller.
Some instructions are not converted for the following causes.
Refer to Section 7.2 Instruction Conversion to change the program manually.

(1) The change target programmable controller does not have the equivalent functions and instructions.
(2) Instructions to specified modules cause to change the module and buffer memory configuration.
(3) Multiple instructions with the same name and argument exist.
(Example) CHK instruction, etc.
(4) The conversion causes a mismatch in the instructions.
(Example) IX instruction

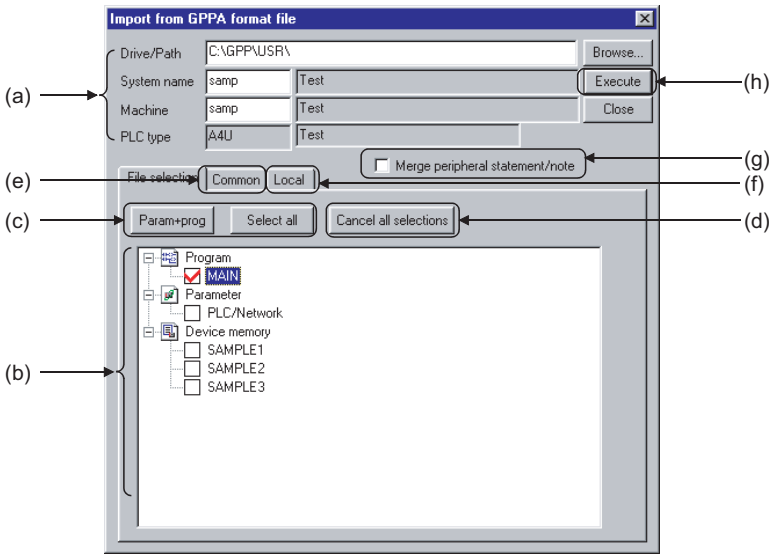
7.1.4 Reading (Reusing) other format files

The following explains how to read (appropriate) files in the GPPQ/GPPA format other than that of GX Developer. Follow this procedure to convert them to the file format of GX Developer.

(1) Operation procedure

Select [Project] → [Import file] → [Import from GPPQ format file]
[Import from GPPA format file]

(2) Setting screen



(a) Drive/Path, System name, Machine name, PLC type

Designates the location of data created in GPPQ or GPPA format.
Enter the system name and machine name of the data specified in the Drive/Path.
Clicking the [Browse] button shows the dialog box for choosing the system name and machine name.
Double-click the file to be read to specify.

(b) Source data list

Displays data created in GPPQ or GPPA format.
Check the checkbox of data names to be selected.
For the selected comments, the range of device comment, which can be read with the Common tab or Local tab, are settable.

(c) [Param+prog] button/[Select all] button

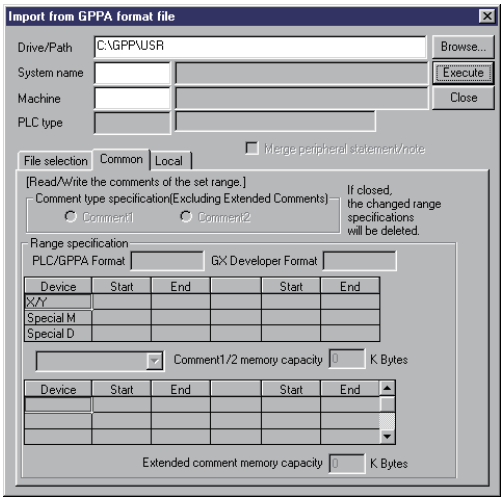
- [Param+prog] button
  Selects only the parameter data and program data of the source data.
- [Select all] button
  Selects all data in a source data list.
  Comment 2 is selected for the A series, and the device memories of the number of data are displayed.
  The first data name is selected for comments and file registers in the QnA series.

(d) [Cancel all selections] button

Cancels all the selected data.

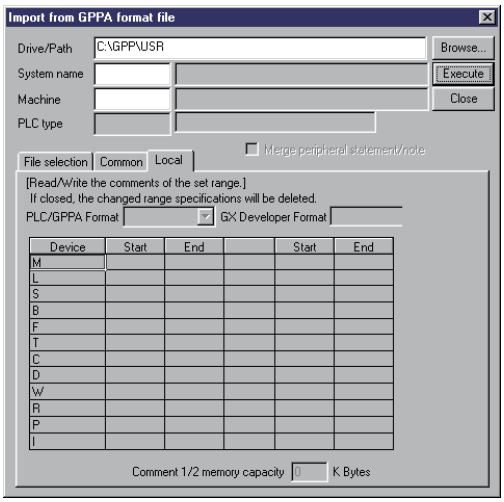
(e) <<Common>> tab screen (A series)

Set this when specifying the range for common comments and read data.



(f) <<Local>> tab screen (A series)

Set this when specifying the range for comments by program and read data.



(g) Merge peripheral statement/note

For details of peripheral statements and merging notes, refer to the GX Developer Operating Manual.

(h) [Execute] button

Click this button after making the setting.

(3) Setting procedure

(a) Data selection

1) Set a drive/path for reading in GPPQ or GPPA format.
2) Click the [Browse] button to set the system name and machine name of the project to be read.
3) Check the checkbox of data to be selected by with the [Param+prog] button, [Select all] button, or the mouse.
4) Click the [Execute] button after making necessary settings.

(b) Canceling data selection

1) When canceling the selected data arbitrarily:
   Clear the checkmark (P) in the checkbox with the mouse or space key.
2) When canceling all the selected data:
   Click the [Cancel all selection] button.

(4) Precautions for reading the other format files

For A series	
A6GPP, SW0S-GPPA format data	Read data with GX Developer after performing the corresponding format conversion with GPPA. For the operating methods, refer to the Type SW4IVD-GPPA(GPP) Operating Manual.
For data selection	For device comment selection, you may only choose either comment 2 or comment 1.
GPPA format file reading	Deletes the project data on GX Developer and read the other format file. The area in excess of the program capacity is deleted when read. For the programmable controller type which cannot use subprograms, subprograms are deleted when read. When the file includes microcomputer programs edited with other than the SFC program (e.g. SW0SRX-FNUP), they are lost.

For QnA series	
Ladder return positions	Returning places are different between GPPQ and GX Developer. Because of this, if the total of return sources and return destinations exceeds 24 lines in a single ladder block, the program is not displayed properly. Corrective action: Add SM400 (normally ON contact) to adjust the return positions.
For data selection	For the device memory and file register, you may select only one data name for each item.

7.2 Instruction Conversion

GX Developer enables instruction conversion using "Change PLC type".
The following explains how to process both applicable instructions and not applicable instructions for the conversion.

7.2.1 List of instructions conversion from ACPU to QCPU (Sequence/Basic/ Application instructions)

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
BIN 16-bit addition, subtraction	+	+	○	
	+P	+P	○	
	-	-	○	
	-P	-P	○	
BIN 16-bit multiplication, division	*	*	○	
	*P	*P	○	
	/	/	○	
	/P	/P	○	
Ladder block series connection	ANB	ANB	○	
Series connection	AND	AND	○	
16-bit data comparison	AND<	AND<	○	
	AND<=	AND<=	○	
	AND<>	AND<>	○	
	AND=	AND=	○	
	AND>	AND>	○	
	AND>=	AND>=	○	
32-bit data comparison	ANDD<	ANDD<	○	
	ANDD<=	ANDD<=	○	
	ANDD<>	ANDD<>	○	
	ANDD=	ANDD=	○	
	ANDD>	ANDD>	○	
	ANDD>=	ANDD>=	○	
Series connection	ANI	ANI	○	
Conversion from hexadecimal BIN to ASCII	ASC	OUT SM1255	×	Section 7.2.3 (3)
BCD 4-digit addition, subtraction	B+	B+	○	
	B+P	B+P	○	
	B-	B-	○	
	B-P	B-P	○	
BCD 4-digit multiplication, division	B*	B*	○	
	B*P	B*P	○	
	B/	B/	○	
	B/P	B/P	○	
Conversion from BIN data to 4-digit BCD	BCD	BCD	○	
	BCDP	BCDP	○	
Conversion from 4-digit BCD to BIN data	BIN	BIN	○	
	BINP	BINP	○	
Block 16-bit data transfer	BMOV	BMOV	○	
	BMOVP	BMOVP	○	
Bit reset for word devices	BRST	BRST	○	
	BRSTP	BRSTP	○	
Bit set for word devices	BSET	BSET	○	
	BSETP	BSETP	○	
1-bit shift to left of n-bit data	BSFL	BSFL	○	
	BSFLP	BSFLP	○	
1-bit shift to right of n-bit data	BSFR	BSFR	○	
	BSFRP	BSFRP	○	

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
Sub-routine program calls	CALL	CALL	○	
	CALLP	CALLP	○	
Special format failure checks	CHK	OUT SM1255	△	Section 7.2.3 (3)
Bit device output reverse	CHK	OUT SM1255	×	Section 7.2.3 (1)
Main ↔ subprogram switching	CHG	OUT SM1255	×	Section 7.2.3 (2)
Pointer branch instruction	CJ	CJ	○	
Carry flag reset	CLC	OUT SM1255	×	Section 7.2.3 (3)
16-bit data negation transfer	CML	CML	○	
	CMLP	CMLP	○	
Link Refresh Instructions	COM	COM	○	
BIN 32-bit addition, subtraction	D+	D+	○	
	D+P	D+P	○	
	D-	D-	○	
	D-P	D-P	○	
BIN 32-bit multiplication, division	D*	D*	○	
	D*P	D*P	○	
	D/	D/	○	
	D/P	D/P	○	
Logical products of 32-bit data	DAND	DAND	○	
	DANDP	DANDP	○	
BCD 8-digit addition, subtraction	DB+	DB+	○	
	DB+P	DB+P	○	
	DB-	DB-	○	
	DB-P	DB-P	○	
BCD 8-digit multiplication, division	DB*	DB*	○	
	DB*P	DB*P	○	
	DB/	DB/	○	
	DB/P	DB/P	○	
Conversion from BIN data to 8-digit BCD	DBCD	DBCD	○	
	DBCDP	DBCDP	○	
Conversion from 8-digit BCD to BIN data	DBIN	DBIN	○	
	DBINP	DBINP	○	
32-bit data negation transfer	DCML	DCML	○	
	DCMLP	DCMLP	○	
32-bit BIN data decrement	DDEC	DDEC	○	
	DDECP	DDECP	○	
16-bit BIN data decrement	DEC	DEC	○	
	DECP	DECP	○	
8 → 256-bit decode	DECO	DECO	○	
	DECOP	DECOP	○	
2-word data read from the intelligent/special function module	DFRO	DFRO	○*1	
	DFROP	DFROP	○*1	
Interrupt disable instruction	DI	DI	○	
Refresh disable	DI	DI	○	
32-bit BIN data increment	DINC	DINC	○	
	DINCP	DINCP	○	
4-bit groupings of 16-bit data	DIS	DIS	○	
	DISP	DISP	○	
32-bit data transfer	DMOV	DMOV	○	
	DMOVP	DMOVP	○	
Logical sums of 32-bit data	DOR	DOR	○	
	DORP	DORP	○	
Left rotation of 32-bit data	DRCL	DRCL	○	Section 7.7.8
	DRCLP	DRCLP	○	Section 7.7.8
Right rotation of 32-bit data	DRCR	DRCR	○	Section 7.7.8
	DRCRP	DRCRP	○	Section 7.7.8
Left rotation of 32-bit data	DROL	DROL	○	Section 7.7.8
	DROLP	DROLP	○	Section 7.7.8
Right rotation of 32-bit data	DROR	DROR	○	Section 7.7.8
	DRORP	DRORP	○	Section 7.7.8

*1 Note that the buffer memory address between Q series and A series may differ

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
1-word shift to left of n-word data	DSFL	DSFL	○	
	DSFLP	DSFLP	○	
1-word shift to right of n-word data	DSFR	DSFR	○	
	DSFRP	DSFRP	○	
32 bit data checks	DSUM	DSUM	○	Section 7.7.8
	DSUMP	DSUMP	○	Section 7.7.8
2-word data write to the intelligent/special function module	DTO	DTO	○*1	
	DTOP	DTOP	○*1	
Timing pulse generation	DUTY	DUTY	○	
32-bit data conversion	DXCH	DXCH	○	
	DXCHP	DXCHP	○	
32-bit data non-exclusive logical sum operations	DXNR	DXNR	○	
	DXNRP	DXNRP	○	
32-bit exclusive logical sum operations	DXOR	DXOR	○	
	DXORP	DXORP	○	
Interrupt enable instruction	EI	EI	○	
Link refresh enable	EI	EI	○	
256 → 8-bit encode	ENCO	ENCO	○	
	ENCOP	ENCOP	○	
Sequence program termination	END	END	○	
Main routine program termination	FEND	FEND	○	
Reading oldest data from tables	FIFR	FIFR	○	
	FIFRP	FIFRP	○	
Writing data to the data table	FIFW	FIFW	○	
	FIFWP	FIFWP	○	
Identical 16-bit data block transfers	FMOV	FMOV	○	
	FMOVP	FMOVP	○	
FOR to NEXT instruction	FOR	FOR	○	
1-word data read from the intelligent/ special function module	FROM	FROM	○*1	
	FROMP	FROMP	○*1	
16-bit BIN data increment	INC	INC	○	
	INCP	INCP	○	
Return from interrupt programs	IRET	IRET	○	
Pointer branch instruction	JMP	JMP	○	
Operation start	LD	LD	○	
BIN 16-bit data comparison	LD<	LD<	○	
	LD<=	LD<=	○	
	LD<>	LD<>	○	
	LD=	LD=	○	
	LD>	LD>	○	
	LD>=	LD>=	○	
BIN 32-bit data comparison	LDD<	LDD<	○	
	LDD<=	LDD<=	○	
	LDD<>	LDD<>	○	
	LDD=	LDD=	○	
	LDD>	LDD>	○	
	LDD>=	LDD>=	○	
Operation start	LDI	LDI	○	
ASCII code display instruction	LED	OUT SM1255	×	Section 7.2.3 (3)

*1 Note that the buffer memory address between Q series and A series may differ.

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
Character display instruction	LEDA	OUT SM1255	×	Section 7.2.3 (3)
	LEDB	OUT SM1255	×	Section 7.2.3 (3)
Comment display instruction	LEDC	OUT SM1255	×	Section 7.2.3 (3)
Annunciator reset instruction	LEDR	LEDR	○	
Local station data read	LRDP	OUT SM1255	×	Section 7.2.3 (3)
Local station data write	LWTP	OUT SM1255	×	Section 7.2.3 (3)
Master control set, reset	MC	MC	○	
	MCR	MCR	○	
16-bit data transfer	MOV	MOV	○	
	MOVP	MOVP	○	
Operation result pop	MPP	MPP	○	
Operation result push	MPS	MPS	○	
Operation result read	MRD	MRD	○	
BIN 16-bit data 2's complement	NEG	NEG	○	
	NEGP	NEGP	○	
FOR to NEXT instruction	NEXT	NEXT	○	
No operation (NOP, NOPLF)	NOP	NOP	○	
	NOPLF	NOPLF	○	
Parallel connection	OR	OR	○	
BIN 16-bit data comparison	OR<	OR<	○	
	OR<=	OR<=	○	
	OR<>	OR<>	○	
	OR=	OR=	○	
	OR>	OR>	○	
	OR>=	OR>=	○	
Ladder block parallel connection	ORB	ORB	○	
BIN 32-bit data comparison	ORD<	ORD<	○	
	ORD<=	ORD<=	○	
	ORD<>	ORD<>	○	
	ORD=	ORD=	○	
	ORD>	ORD>	○	
	ORD>=	ORD>=	○	
Parallel connection	ORI	ORI	○	
OUT instruction	OUT (*2)	OUT (*2)	○	
Trailing edge output	PLF	PLF	○	
Leading edge output	PLS	PLS	○	
Print ASCII code instruction	PR	PR	△	
Print comment instruction	PRC	PRC	△	
Left rotation of 16-bit data	RCL	RCL	○	Section 7.7.8
	RCLP	RCLP	○	Section 7.7.8
Right rotation of 16-bit data	RCR	RCR	○	Section 7.7.8
	RCRP	RCRP	○	Section 7.7.8
Return from subroutine program	RET	RET	○	
Remote I/O station data read	RFRP	OUT SM1255	×	Section 7.2.3 (3)
Read from automatic updating buffer memory	RIFR	OUT SM1255	×	Section 7.2.3 (11)
Read from intelligent device station buffer memory (with handshake)	RIRCV	OUT SM1255	×	Section 7.2.3 (11)
Read from intelligent device station buffer memory	RIRD	OUT SM1255	×	Section 7.2.3 (11)
Write to intelligent device station buffer memory (with handshake)	RISEND	OUT SM1255	×	Section 7.2.3 (11)
Write to automatic updating buffer memory	RITO	OUT SM1255	×	Section 7.2.3 (11)
Write to intelligent device station buffer memory	RIWT	OUT SM1255	×	Section 7.2.3 (11)
Network parameter setting	RLPA	OUT SM1255	×	Section 7.2.3 (11)
Automatic refresh parameter setting	RRPA	OUT SM1255	×	Section 7.2.3 (11)

*2 The high-speed timer or retentive timer can also be converted according to the parameter setting.

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
Left rotation of 16-bit data	ROL	ROL	○	Section 7.7.8
	ROLP	ROLP	○	Section 7.7.8
Right rotation of 16-bit data	ROR	ROR	○	Section 7.7.8
	RORP	RORP	○	Section 7.7.8
Bit device reset	RST	RST	○	
Remote I/O station data write	RTOP	OUT SM1255	×	Section 7.2.3 (3)
Pointer branch instruction	SCJ	SCJ	○	
7 segment decode	SEG	SEG	○	
Partial refresh	SEG	SEG	×	
16-bit data search	SER	SER	○	Section 7.7.8
	SERP	SERP	○	Section 7.7.8
Bit device set	SET	SET	○	
16-bit data n-bit left shift	SFL	SFL	○	
	SFLP	SFLP	○	
16-bit data n-bit right shift	SFR	SFR	○	
	SFRP	SFRP	○	
Bit device shift	SFT	SFT	○	
	SFTP	SFTP	○	
Setting and resetting status latch	SLT	OUT SM1255	×	Section 7.2.3 (3)
	SLTR	OUT SM1255	×	Section 7.2.3 (3)
Carry flag set	STC	OUT SM1255	×	Section 7.2.3 (3)
Sequence program stop	STOP	STOP	○	
Setting and resetting sampling trace	STRA	OUT SM1255	×	Section 7.2.3 (3)
	STRAR	OUT SM1255	×	Section 7.2.3 (3)
16-bit data checks	SUM	SUM	○	
	SUMP	SUMP	○	
Microcomputer program	SUB	OUT SM1255	×	
	SUBP	OUT SM1255	×	
1-word data write to the intelligent/ special function module	TO	TO	○*1	
	TOP	TOP	○*1	
4-bit linking of 16-bit data	UNI	UNI	○	
	UNIP	UNIP	○	
Logical products with 16-bit data	WAND	WAND	○	
	WANDP	WANDP	○	
WDT reset	WDT	WDT	○	
	WDTP	WDTP	○	
Logical sums of 16-bit data	WOR	WOR	○	
	WORP	WORP	○	
16-bit data non-exclusive logical sum operations	WXNR	WXNR	○	
	WXNRP	WXNRP	○	
16-bit exclusive logical sum operations	WXOR	WXOR	○	
	WXORP	WXORP	○	
16-bit data conversion	XCH	XCH	○	
	XCHP	XCHP	○	

*1 Note that the buffer memory address between Q series and A series may differ.

7.2.2 List of instruction conversion from ACPU to QCPU (Dedicated instructions)

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
COS^{-1} operation on floating point data	ACOS	ACOS	○	
Floating point data addition	ADD	E+	○	
Conversion from hexadecimal BIN to ASCII	ASC	ASC	○	
SIN^{-1} operation on floating point data	ASIN	ASIN	○	
TAN^{-1} operation on floating point data	ATAN	ATAN	○	
BCD type COS^{-1} operation	BACOS	BACOS	○	
BIN 16-bit dead band controls	BAND	BAND	○	
BCD type SIN^{-1} operations	BASIN	BASIN	○	
BCD type TAN^{-1} operations	BATAN	BATAN	○	
Conversion from 4-digit BCD to decimal ASCII	BCDDA	BCDDA	○	
BCD type COS operations	BCOS	BCOS	○	
BCD 8-digit square roots	BDSQR	BDSQR	○	
Conversion from BIN 16-bit to decimal ASCII	BINDA	BINDA	○	
Conversion from BIN 16-bit to hexadecimal ASCII	BINHA	BINHA	○	
Block move between extension file registers	BMOVR	OUT SM1255	×	Section 7.2.3 (4)
Forced end of FOR to NEXT instruction loop	BREAK	BREAK	○	
BCD type SIN operations	BSIN	BSIN	○	
BCD 4-digit square roots	BSQR	BSQR	○	
BCD type TAN operations	BTAN	BTAN	○	
Data linking in byte units	BTOW	BTOW	○	
Block exchange between extension file registers	BXCHR	OUT SM1255	×	Section 7.2.3 (4)
Consecutive display of the same character	CC1	OUT SM1255	×	Section 7.2.3 (11)
	CC2	OUT SM1255	×	Section 7.2.3 (11)
Changing the character color	CCDSP	OUT SM1255	×	Section 7.2.3 (11)
	CCDSPV	OUT SM1255	×	Section 7.2.3 (11)
Special format failure checks	CHK	OUT SM1255	○	Section 7.2.3 (3), (4)
Changing check format of CHK instruction	CHKEND	OUT SM1255	○	Section 7.2.3 (4)
Displaying numerals	CIN0 to CIN9	OUT SM1255	×	Section 7.2.3 (11)
Displaying letters of the alphabet	CINA to CINZ	OUT SM1255	×	Section 7.2.3 (11)
Clearing display of designated area	CINCLR	OUT SM1255	×	Section 7.2.3 (11)
Displaying "-" (hyphen)	CINHP	OUT SM1255	×	
Displaying "-" (minus)	CINMP	OUT SM1255	×	
Displaying "." (period, decimal point)	CINPT	OUT SM1255	×	
Displaying spaces	CINSP	OUT SM1255	×	Section 7.2.3 (11)
Clearing the display area	CLS	OUT SM1255	×	Section 7.2.3 (11)
Clearing the VRAM area	CLV	OUT SM1255	×	Section 7.2.3 (11)
Setting the display mode	CMODE	OUT SM1255	×	Section 7.2.3 (11)
Transferring canvas data to the VRAM area	CMOV	OUT SM1255	×	Section 7.2.3 (11)
Setting normal display for characters	CNOR	OUT SM1255	×	Section 7.2.3 (11)
Displaying the cursor	COFF	OUT SM1255	×	Section 7.2.3 (11)
Designating the character display color	COLOR	OUT SM1255	×	Section 7.2.3 (11)
Reading device comment data	COMRD	COMRD	○	
Displaying the cursor	CON1	OUT SM1255	×	Section 7.2.3 (11)
	CON2	OUT SM1255	×	Section 7.2.3 (11)
COS operations on floating decimal point data	COS	COS	○	
Displaying a canvas screen	CPS1	OUT SM1255	×	Section 7.2.3 (11)
Changing the VRAM display address	CPS2	OUT SM1255	×	Section 7.2.3 (11)
Consecutive display of the same character	CR1	OUT SM1255	×	Section 7.2.3 (11)
	CR2	OUT SM1255	×	Section 7.2.3 (11)
Switching between normal and highlighted display for characters	CRDSP	OUT SM1255	×	Section 7.2.3 (11)
	CRDSPV	OUT SM1255	×	Section 7.2.3 (11)
Setting highlighted display for characters	CREV	OUT SM1255	×	Section 7.2.3 (11)

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
Scrolling the screen	CSCRD	OUT SM1255	×	Section 7.2.3 (11)
	CSCRU	OUT SM1255	×	Section 7.2.3 (11)
Conversion from decimal ASCII to BCD 4-digit data	DABCD	DABCD	○	
Conversion from decimal ASCII to BIN 16-bit data	DABIN	DABIN	○	
Reading clock data	DATERD	DATERD	○	
Writing in clock data	DATEWR	DATEWR	○	
BIN 32-bit dead band controls	DBAND	DBAND	○	
Conversion from BCD 8-digit to decimal ASCII data	DBCDDA	DBCDDA	○	
Conversion from BIN 32-bit to decimal ASCII data	DBINDA	DBINDA	○	
Conversion from BIN 32-bit data to hexadecimal ASCII data	DBINHA	DBINHA	○	
Conversion from decimal ASCII to BCD 8-digit data	DDABCD	DDABCD	○	
Conversion from decimal ASCII to BIN 32-bit data	DDABIN	DDABIN	○	
Conversion from floating point radian to angle	DEG	DEG	○	
Conversion from BIN 32-bit to floating point data	DFLOAT	DFLT	○	
Conversion from hexadecimal ASCII to BIN 32-bit data	DHABIN	DHABIN	○	
Conversion from floating point to BIN 32-bit data	DINT	DINT	○	
Dissociation of random data	DIS	NDIS	○	
Division of floating decimal point data	DIV	E/	○	
Upper and lower limit controls for BIN 32-bit data	DLIMIT	DLIMIT	○	
Direct output	DOUT	OUT	○	
Direct Reset	DRST	RST	○	
32-bit data searches	DSER	DSER	○	
Direct Set	DSET	SET	○	
Conversion from BIN 32-bit to character string	DSTR	DSTR	○	
Bit tests	DTEST	DTEST	○	
Conversion from character string to BIN 32-bit data	DVAL	DVAL	○	
Zone control for BIN 32-bit data	DZONE	DZONE	○	
Displaying characters	EPR	OUT SM1255	×	Section 7.2.3 (11)
	EPRN	OUT SM1255	×	Section 7.2.3 (11)
Writing characters to the VRAM	EPRV	OUT SM1255	×	Section 7.2.3 (11)
	EPRNV	OUT SM1255	×	Section 7.2.3 (11)
Exponent operations on floating decimal point data	EXP	EXP	○	
Sub-routine program output OFF calls	FCALL	FCALL	○	
Bit device output reverse	FF	FF	○	
Conversion from BIN 16 data to floating decimal point	FLOAT	FLT	○	
Reading VRAM data	GET	OUT SM1255	×	Section 7.2.3 (8), (11)
Conversion from hexadecimal ASCII to BIN 16-bit	HABIN	HABIN	○	
Conversion from ASCII to hexadecimal BIN	HEX	HEX	○	
ASCII code conversion of designated character strings	INPUT	OUT SM1255	×	Section 7.2.3 (11)
Receiving data	INPUT2	OUT SM1255	×	Section 7.2.3 (9)
	INPUT4	OUT SM1255	×	Section 7.2.3 (9)
Conversion from floating decimal point data to BIN 16	INT	INT	○	
Index qualification of a circuit block	IX	OUT SM1255	×	Section 7.2.3 (4)
	IXEND	OUT SM1255	×	Section 7.2.3 (4)
Entering data from number keys	KEY	KEY	△	
Detecting character-string length	LEN	LEN	○	
Upper and lower limit controls for BIN 16-bit data	LIMIT	LIMIT	○	
Setting the cursor position	LOCATE	OUT SM1255	×	Section 7.2.3 (11)
Natural logarithm operations on floating decimal point data	LOG	LOG	○	
Reading word devices in local station	LRDP	OUT SM1255	×	Section 7.2.3 (4)
Writing data to word devices in local station	LWTP	OUT SM1255	×	Section 7.2.3 (4)
Communication with remote terminal modules	MINI	OUT SM1255	×	Section 7.2.3 (10)
Error resetting with remote terminal modules	MINIERR	OUT SM1255	×	Section 7.2.3 (10)
Multiplication of floating decimal point data	MUL	E*	○	
Monitoring PID Control Status	PID57	OUT SM1255	×	Section 7.2.3 (4)
PID control	PIDCONT	PIDCONT	○	
PID control data setting	PIDINIT	PIDINIT	○	
Displaying ASCII characters	PR	OUT SM1255	×	Section 7.2.3 (7), (8), (10), (11)
Sending data up to 00_H code	PR2	OUT SM1255	×	Section 7.2.3 (9)
	PR4	OUT SM1255	×	Section 7.2.3 (9)

○: Automatic conversion △: Automatic conversion (High Performance model QCPU only) ×: Manual change required

Contents	ACPU	Universal model QCPU High Performance model QCPU		Reference section
	Instruction name	Instruction name	Conversion	
Displaying ASCII characters	PRN	OUT SM1255	×	Section 7.2.3 (7), (8), (10), (11)
Sending designated number of bytes of data	PRN2	OUT SM1255	×	Section 7.2.3 (9)
	PRN4	OUT SM1255	×	Section 7.2.3 (9)
Writing ASCII characters to the VRAM	PRV	OUT SM1255	×	Section 7.2.3 (11)
	PRNV	OUT SM1255	×	Section 7.2.3 (11)
Writing VRAM data	PUT	OUT SM1255	×	Section 7.2.3 (8), (9), (11)
Reading present value	PVRD1	OUT SM1255	×	Section 7.2.3 (6)
	PVRD2	OUT SM1255	×	Section 7.2.3 (6)
Setting preset data	PVWR1	OUT SM1255	×	Section 7.2.3 (6)
	PVWR2	OUT SM1255	×	Section 7.2.3 (6)
Conversion from floating decimal point angle to radian	RAD	RAD	○	
Remote I/O station data read	RFRP	OUT SM1255	×	Section 7.2.3 (4)
Changing the extension file register block number	RSET	OUT SM1255	×	Section 7.2.3 (4)
Remote I/O station data write	RTOP	OUT SM1255	×	Section 7.2.3 (4)
Block addition and subtraction	SADD	$+	○	
Comparison between character strings	SCMP	OUT SM1255	×	Section 7.2.3 (4)
SIN operation on floating decimal point data	SIN	SIN	○	
Character string transfers	SMOV	$MOV	○	
Reading communication status	SPBUSY	OUT SM1255	×	Section 7.2.3 (7), (9), (10)
Forced stop of communication processing	SPCLR	OUT SM1255	×	Section 7.2.3 (7), (9), (10)
Square root operations for floating decimal point data	SQR	SQR	○	
Reading the display status	STAT	OUT SM1255	×	Section 7.2.3 (11)
Conversion from BIN 16-bit to character string	STR	STR	○	
Subtraction of floating decimal point data	SUB	E-	○	
Setting comparison reference data	SVWR1	OUT SM1255	×	Section 7.2.3 (6)
	SVWR2	OUT SM1255	×	Section 7.2.3 (6)
Upper and lower byte exchanges	SWAP	SWAP	○	
TAN operation on floating decimal point data	TAN	TAN	○	
Bit test	TEST	TEST	○	
Linking of random data	UNI	NUNI	○	
Conversion from character string to BIN 16-bit data	VAL	VAL	○	
Data dissociation in byte units	WTOB	WTOB	○	
Program switching	ZCHG0	OUT SM1255	×	Section 7.2.3 (4)
	ZCHG1	OUT SM1255	×	Section 7.2.3 (4)
	ZCHG2	OUT SM1255	×	Section 7.2.3 (4)
	ZCHG3	OUT SM1255	×	Section 7.2.3 (4)
Link refresh of designated network	ZCOM	S.ZCOM	○	Section 7.2.3 (5)
Reading/writing data from/to special function module in MELSECNET/10 remote I/O station	ZNFR	OUT SM1255	×	Section 7.2.3 (5)
	ZNTO	OUT SM1255	×	Section 7.2.3 (5)
Reading from/writing to word devices in the MELSECNET/10 station	ZNRD	J.ZNRD	○	Section 7.2.3 (5)
	ZNWR	J.ZNWR	○	Section 7.2.3 (5)
Zone control for BIN 16-bit data	ZONE	ZONE	○	
Direct read/write of extension file registers in 1-word units	ZRRD	OUT SM1255	×	Section 7.2.3 (4)
	ZRWR	OUT SM1255	×	Section 7.2.3 (4)
Direct read/write of extension file registers in units of bytes	ZRRDB	OUT SM1255	×	Section 7.2.3 (4)
	ZRWRB	OUT SM1255	×	Section 7.2.3 (4)

7.2.3 Instructions that may need a replacement at instruction conversion from ACPU to QCPU

Some instructions are not automatically converted upon the replacement of the ACPU with QCPU. The following table shows the instructions that are not automatically converted. Reviewing the program is recommended.

Item No.	Instruction type		ACPU instruction	Corrective action
(1)	Sequence instruction	Bit device output inversion instruction	CHK	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instruction: [FF] instruction
(2)	Basic instruction	Program switching instruction	CHG	(Counter Measure) Review the program with referring to Section 7.7.10.
(3)	Application instruction	ASCII code conversion instruction	ASC	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instruction: [$MOV] instruction
		MELSECNET (II), /B Local, Remote I/O station access instruction	LRDP LWTP RFRP RTOP	(Counter Measure) Reprogram for the network modules to use with a QCPU.
		Display instructions (except dedicated instruction)	LED LEDA LEDB LEDC	(Counter Measure) Setting an external display is recommended since the QCPU does not have the LED display function.
		Special format failure checks instruction	CHK	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instruction: [CHKST], [CHK] instruction
		Status latch instruction	SLT SLTR	(Counter Measure) There is no alternative action.
		Sampling trace instruction	STRA STRAR	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instructions: [STRA] → [TRACE] instruction [STRAR] → [TRACER] instruction
		Carry flag instruction	STC0693-tomoya CLC	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instructions: [STC] → [SET SM700] instruction [CLC] → [RST SM700] instruction
		Print ASCII code instruction	PR	(Counter Measure) The High Performance model QCPU can use these instructions. For measures of when the Universal model CPU is used, refer to the TECHNICAL BULLETIN (No. FA-A-0068).
		Comment print instruction	PRC	

Item No.	Instruction type		ACPU instruction	Corrective action
(4)	Dedicated instruction	Structured programs instruction	CHK	(Counter Measure) Change manually with the special format failure check instruction [CHK] of the application instructions. (Supplement) Change candidate instructions: [CHK] → [CHKCIR] instruction [CHKEND] → [CHKEND] instruction
			CHKEND	
			IX	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instruction: [IX] → [IX] instruction [IXEND] → [IXEND] instruction
			IXEND	
		MELSEC (II), /B Local, Remote I/O station access instruction	LRDP	(Counter Measure) Reprogram the network modules to use with the QCPU.
			LWTP	
			RFRP	
			RTOP	
		Character string data comparisons instruction	SCMP	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instructions: [LD$=], [AND$=], [OR$=] instruction
		Extension file register instruction	BMOVR	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instructions: [BMOV], [MOV], [RSET] instruction
			BXCHR	
			RSET	
			ZRRD	
			ZRRDB	
			ZRWR	
			ZRWRB	
		Program switching instruction	ZCHG0	(Counter Measure) Review the program with referring to Section 7.7.10
			ZCHG1	
			ZCHG2	
			ZCHG3	
		PID control instruction	PID57	(Counter Measure) There is no alternative action.
(5)	Network dedicated instruction	Network instruction	ZCOM	(Counter Measure) Review the program and change manually. (Supplement) Change candidate instructions: [S (P). ZCOM Jn] or [S (P). ZCOM Un] instruction
			ZNRD	(Counter Measure) Reprogram the network modules to use with the QCPU.
			ZNWR	
			ZNFR	
			ZNTO	

Item No.	Instruction type		ACPU instruction	Corrective action
(6)	Special function modules instruction	Control instruction for high-speed counter module type AD61(S1)	PVWR1	(Counter Measure) Reprogram for the network modules to use with the QCPU.
			PVWR2	
			SVWR1	
			SVWR2	
			PVRD1	
			PVRD2	
(7)		Control instruction for computer link module type AJ71C24 (S3,S6,S8)/ AJ71UC24	PRN	
			PR	
			INPUT	
			SPBUSY	
			SPCLR	
(8)		Control instruction for memory card/centronics interface module type AD59	PRN	(Counter Measure) Reprogram for the network modules to use with the QCPU. Restructuring the system is required depending on the module to be used.
			PR	
			GET	
			PUT	
(9)		Control instruction for terminal interface module type AJ71C21 (S1)	PRN2	
			PRN4	
			PR2	
			PR4	
			INPUT2	
			INPUT4	
			GET	
			PUT	
			SPBUSY	
			SPCLR	
(10)		Control instruction for MELSECNET/MINI-S3 master module type AJ71PT32-S3	INPUT	
			PRN	
			PR	
			MINI	
			MINIERR	
			SPBUSY	
			SPCLR	

Item No.	Instruction type		ACPU instruction name	Corrective action
(11)	Special function modules instruction	Control instruction for AD57 (S1)CRT controller module/ AD58 LCD controller module	CMODE	(Counter Measure) Reprogram for the network modules to use with the QCPU. Restructuring the system is required depending on the module to be used.
			CPS1	
			CPS2	
			CMOV	
			CLS	
			CLV	
			CSCRU	
			CSCRD	
			CON1	
			CON2	
			COFF	
			LOCATE	
			CNOR	
			CREV	
			CRDSP	
			CRDSPV	
			COLOR	
			CCDSP	
			CCDSPV	
			PRN	
			PR	
			PRNV	
			PRV	
			EPRN	
			EPR	
			EPRNV	
			EPRV	
			CR1	
			CR2	
			CC1	
			CC2	
			CINMT	
			CIN□ (□:0 to 9,A to Z)	
			CINSP	
			CINCLR	
			INPUT	
			GET	
			PUT	
			STAT	
		CC-Link instruction	RIFR	(Counter Measure) Change manually to the same instructions of the Q series.
			RIRCV	
			RIRD	
			RISEND	
			RITO	
			RIWT	
			RLPA	(Counter Measure) Set parameters with GX Developer.
			RRPA	

7.2.4 Instruction conversion from QnACPU to QCPU

The automatic conversion is applied to the instructions of which equivalent functions and instructions exist in the change target programmable controller.
For instructions that are not automatically converted, consider reviewing the program referring to the unconvertible instructions described in Section 7.2.5.
Re-program for the modules to use with the QCPU, since the specifications of the special function module instructions differ between QCPU compatible modules and QnACPU compatible modules.

7.2.5 Instructions that may need a replacement after conversion from QnACPU to QCPU

Some instructions are not automatically converted upon the replacement of the QnACPU with the QCPU.
The following table shows the instructions that are not automatically converted and their measures. Reviewing the program is recommended.

<table>
<tr><th colspan="2">Instruction type</th><th>QnACPU instruction</th><th>Corrective action</th></tr>
<tr><td rowspan="11">Application instruction</td><td rowspan="2">Display instruction</td><td>LED</td><td rowspan="2">(Counter Measure)
Setting an external display is recommended since the QCPU does not have the LED display function.</td></tr>
<tr><td>LEDC</td></tr>
<tr><td rowspan="2">Status latch instruction</td><td>SLT</td><td rowspan="2">(Counter Measure)
There is no alternative action.</td></tr>
<tr><td>SLTR</td></tr>
<tr><td rowspan="2">Sampling trace instruction</td><td>STRA</td><td rowspan="2">(Counter Measure)
Review the program and change manually.
(Supplement)
Change candidate instructions:
[STRA] → [TRACE] instruction
[STRAR] → [TRACER] instruction</td></tr>
<tr><td>STRAR</td></tr>
<tr><td rowspan="3">Program trace instruction</td><td>PTRA</td><td rowspan="3">(Counter Measure)
There is no alternative action.</td></tr>
<tr><td>PTRAR</td></tr>
<tr><td>PTRAEXE</td></tr>
<tr><td rowspan="2">Other instruction</td><td>EROMWR</td><td>(Counter Measure)
Review the program and change manually. (Use the ATA card as a memory card.)
(Supplement)
Change candidate instruction: [EROMWR] → [FWRITE] instruction</td></tr>
<tr><td>Print ASCII code instruction</td><td>PR</td><td rowspan="2">(Counter Measure)
The High Performance model QCPU can use these instructions.
For measures of when the Universal model CPU is used, refer to the TECHNICAL BULLETIN (No. FA-A-0068).</td></tr>
<tr><td>Comment print instruction</td><td>PRC</td></tr>
<tr><td colspan="2">PID control instruction</td><td>PID57</td><td>(Counter Measure)
There is no alternative action.</td></tr>
<tr><td colspan="2">Special function modules instruction
Example: G. INPUT, G. PRN, etc.</td><td>G (P).
[Instruction name]</td><td>(Counter Measure)
Reprogram for the special function modules to use with the QCPU.</td></tr>
</table>

7.3 Precautions for Parameter Replacement

7.3.1 Conversion from ACPU to QCPU

This section explains the parameter conversion upon replacement of the ACPU programs with the QCPU.

<Compatibility>

○: Common item between ACPU and QCPU, that can be converted directly.
△: Item that requires re-setting after the conversion, since the functions/specifications are partially different
×: Item to be deleted, since there is no common item between the ACPU and QCPU

Confirm the parameters after the conversion, and correct/re-set as required.

Name			Compati-bility	Remarks
Memory capacity	Sequence program capacity		△	No need to care about the program capacity.
	Microcomputer program capacity		×	No microcomputer program is available.
	Comment capacity		△	Not required, since comments can be created for all devices.
	File register capacity		△	Resetting is required since the specifications are different.
PLC RAS setting	WDT setting		△	This becomes default (200ms).
	Operation mode when these is an error		△	This becomes default (All stop).
	Annunciator display mode		×	No compatible function is available.
PLC system setting	RUN - PAUSE contact		△	Re-setting is required.
	Output mode at STOP to RUN		△	This becomes default (Output before STOP).
	Data communications request batch processing		△	Use the COM instruction as required. Set the processing on the service processing setting in the PLC parameter for the Universal model QCPU. Set the time reserved for communications to the special register (SD315) for the High Performance model CPU.
	Interrupt counter setting		△	Re-setting is required.
I/O assignment			△	Reviewing is required for the base unit with other than 8 slots.
Device setting	Number of device points		○	This resets to default. Correcting program is not required, since the device points are more than those of ACPU.
	Latch range	Latch relay L	○	M and L are different devices. "L" on the program is converted to "L".
		Data register D	○	
		Link relay B	○	
		Link register W	○	
		Low-speed timer High-speed timer Extension low-speed timer Extension high-speed timer	△	Converted as one device. Reviewing is required, since all the range from lowest device No. to highest device No. is included in the latch range.
		Retentive timer Extension retentive timer	△	Converted as one device. Reviewing is required, since all range from lowest device No. to highest device No. is included in the latch range.
		Counter Extension counter	△	Converted as one device. Reviewing is required, since the latch range covers all range from lowest device No. to highest device No.
Network parameter	MELSECNET (II), /B		×	Parameters are deleted, since the QCPU is not compatible with the MELSECNET (II), /B.
	MELSECNET/10 (H)		○	For AnUCPU, converted to the MELSCECNET/10 mode. Parameter re-setting is required for the AnNCPU and AnACPU.
	MELSECNET/MINI		△	Parameters are deleted, since the QCPU is not compatible with the MELSECNET/MINI. (Compatibility is available by creating a sequence program) The Universal model QCPU does not support this parameter.

7.3.2 Conversion from QnACPU to QCPU

This section explains the parameter conversion upon replacement of the QnACPU program with the QCPU.
The symbols in the table indicate the following meanings:
<Compatibility>

○: Common item between QnACPU and QCPU, therefore can be converted directly
△: Item that requires re-setting after the conversion, since the functions/specifications are partially different
×: Item to be deleted, since there is no common item between the QnACPU and QCPU

Confirm the parameters after the conversion, and correct/re-set as required.

Name			Compatibility	Remarks
PLC name setting	Label		○	
	Comment		○	
PLC system setting	Timer limit setting	Low speed	○	
		High speed	○	
	RUN-PAUSE contact	RUN	○	
		PAUSE	○	
	Remote reset		○	
	Output mode at STOP to RUN		○	
	Common pointer No.		○	
	General data processing		△	Use COM instructions or set the communication reserved time for the special register (SD315) as required.
	Number of empty slots		○	
	System interrupt setting	Interrupt counter setting No.	△	Re-setting is required.
		I28 Fixed scan interval	○	
		I29 Fixed scan interval	○	
		I30 Fixed scan interval	○	
		I31 Fixed scan interval	○	
PLC file setting	File register		△	Confirmation is required, since the usable target memory is changed.
	Comment file used in a command		△	Confirmation is required, since the usable target memory is changed.
	Device initial value		△	Confirmation is required, since the usable target memory is changed.
	File for local device		△	Confirmation is required, since the usable target memory is changed.
Device setting	Input relay		○	
	Output relay		○	
	Internal relay		○	
	Latch relay		○	
	Link relay		○	
	Annunciator		○	
	Link special relay		○	
	Edge relay		○	
	Step relay		○	
	Timer		○	
	Retentive timer		○	
	Counter		○	
	Data register		○	
	Link register		○	
	Link special register		○	
	Total of device		○	

Name			Compatibility	Remarks
PLC RAS setting	WDT setting	WDT setting	○	
		Initial execution monitoring time	○	
		Low speed execution monitoring time	○	
	Error check	Carry out battery check	○	
		Carry out fuse blown check	○	
		Carry out I/O module comparison	○	
	Operation mode when there is an error	Computation error	○	
		Expanded command error	○	
		Fuse blown	○	
		I/O module comparison error	○	
		Special module access error	○	The name changes to "Intelligent module program execution error".
		Memory card access error	○	
		Memory card operation error	○	
	Constant scanning		○	
	Annunciator display mode	F No. display	×	The QCPU does not incorporate this display function.
		Comment display	×	The QCPU does not incorporate this display function.
		Occurrence time	×	The QCPU does not incorporate this display function.
	Break down history	Drive	○	Since the storage destination is fixed for the Universal model QCPU, these settings are not available.
		File name	○	
		History No.	○	
	Low speed program execution time		○	The Universal model QCPU does not support low-speed execution type program.
I/O assignment			△	Reviewing is required if the QCPU base unit has other than 8 slots.
Boot file setting			○	
Program setting			○	
SFC setting	SFC program start mode		○	
	Start conditions		○	
	Output mode when the block is stopped		○	
Network parameter	MELSECNET (II), /B		×	Parameters are deleted, since the QCPU is not compatible with the MESECNET (II), /B.
	MELSECNET/10 (H)		○	Converted to the MELSECNET/10 mode.
	MELSECNET/MINI		△	Parameters are deleted, since the QCPU is not compatible with the MESECNET/MINI. (Compatibility is available by creating a sequence program) The Universal model QCPU does not support this parameter.
	CC-Link		○	
	Ethernet		○	The "Use the KeepAlive" of "TCP Existence confirmation setting" in the "Ethernet operations" is automatically set.

7.4 Special Relay Replacement

The special relay is an internal relay that has a set application in a programmable controller.
This section explains how to replace special relays when replacing the ACPU programs with QCPU programs.
For details of each special relay and their operation in A/QnACPU and QCPU, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

7.4.1 Replacing the ACPU with the QCPU

The QCPU uses a different special relay from the one for the ACPU.
With "Change PLC type", the automatic conversion is applied to the replacement of the ACPU special relay (M9000 and after) with the QCPU special relay (SM). (Refer to Section 7.1.2)

Point

Some ACPU special relays are not compatible with the QCPU.
Those special relays not compatible with the QCPU are converted to dummy special relays (SM1255) *1 when changing programmable controller type. Search the dummy special relays (SM1255) and correct the programs as required.

*1 For the Basic model QCPU, it is converted to the SM999.

7.4.2 Replacing the QnACPU with the QCPU

Basically, special relays for the QnACPU can be used without modification in the QCPU.*1
Note that, however, some of them are not compatible with the QCPU.

*1 When programs for the QnA series CPU are replaced with those for the High Performance model QCPU by "Change PLC type", devices for the QnA series CPU, SM1000 to SM1255 and SD1000 to SD1255, are replaced with those for the Q series CPU.
Note when programs for the QnA series CPU are replaced with those for the Basic model QCPU by "Change PLC type", the devices for the QnA series CPU may be replaced with SM999 and SD999 as an unsupported device.

7.5 Special Register Replacement

A special register is an internal register that has a set application in a programmable controller.
This section explains how to replace special registers when replacing the ACPU programs with QCPU programs.
For details of each special register and their operation in A/QnACPU and QCPU, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

7.5.1 Replacing the ACPU with the QCPU

The QCPU uses a different special register from the one for the ACPU.
With "Change PLC type", the automatic conversion is applied to the replacement of the ACPU special register (D9000 and after) with the QCPU special register (SD). (Refer to Section 7.1.2)

Point

Some ACPU special registers are not compatible with the QCPU.
Those special registers not compatible with the QCPU are converted to dummy special registers (SD1255) *1 when changing programmable controller type. Search the dummy special registers (SD1255) and correct the programs as required.

*1 For the Basic model QCPUs, converted to the SD999.

7.5.2 Replacing the QnACPU with the QCPU

Basically, special registers for the QnACPU can be used without modification in the QCPU.*1
Note that, however, some of them are not compatible with the QCPU.

*1 When programs for the QnA series CPU are replaced with those for the High Performance model QCPU by "Change PLC type", devices for the QnA series CPU, SM1000 to SM1255 and SD1000 to SD1255, are replaced with those for the Q series CPU.
Note when programs for the QnA series CPU are replaced with those for the Basic model QCPU by "Change PLC type", the devices for the QnA series CPU may be replaced with SM999 and SD999 as an unsupported device.

7.6 Precautions for Replacing the MELSAP-II with the MELSAP3

The basic operation of the MELSAP3 is the same as the MELSAP-II , but the specifications are partially different.
This section provides the precautions for the replacement.

7.6.1 Starting SFC program

The SFC program can be started by using the special relay for starting/stopping the SFC program. That special replay for the ACPU (M9101) is replaced with the special relay for the QCPU (SM321) upon converting from the ACPU to QCPU. The specifications of the special relay differ between the two CPUs.

Specifications		Precautions for replacement
MELSAP-II (M9101)	MELSAP3 (SM321)	
Switches on and off with user operation.	SFC program starts up at default, since system is automatically turned on.	When starting/stopping the SFC program according to user conditions, turn the SM321 to on/off with program.

7.6.2 Block information (SFC information device)

The MELSAP-II and MELSAP3 have different method of executing the "Block START/STOP" and "Reading of the number of active steps and active step numbers" with block information (SFC information device).

	Specifications		Precautions for replacement
	MELSAP-II	MELSAP3	
Block START/ STOP methods	[START] Switching the block active bit on, executes forced start. [STOP] Switching the block clear bit on, stops the block also switching from on to off executes forced stop.	[START] Switching the block START/STOP bit on starts the concerned block forcibly. [STOP] Switching the block START/STOP bit off stops the concerned block forcibly.	[START] Adjusting program is not required when replacing the SFC program of the ACPU with the QCPU, since in that case, the "Block active bit" is replaced with the "Block START/ STOP bit". [STOP] To stop the block forcibly, create a program to reset "Block START/ STOP bit" of the corresponding block. Delete the program that switches the "Block clear bit" on/off since it is not required.
The number of active steps and active step numbers reading	Reads the number of active steps in the corresponding block and active step numbers.	Reads only the number of active steps in the corresponding block.	To read the active step numbers, use the "Active step batch readout instructions (MOV, DMOV, BMOV)".

7.6.3 Specifications comparison between MELSAP-II and MELSAP3

When a SFC program (MELSAP-II) of the ACPU is used as a SFC program (MELSAP3) of the QCPU, a part of specifications of the SFC program differs.
Select the QCPU which satisfies the contents and configuration of the existing SFC program (MELSAP-II).

Item	MELSAP-II	MELSAP3			
	ACPU	Universal model QCPU		Basic model QCPU	High Performance model QCPU
		Q00UJ, Q00U, Q01U, Q02U	Q03UD, Q04UDH, Q06UDH, Q10UD, Q13UD	Q00J, Q00, Q01	Q02(H), Q06H, Q12H
Number of blocks	Max. 256 blocks	Max. 128 blocks	Max. 320 blocks	Max. 128 blocks	Max. 320 blocks
Number of SFC steps	Max. 255 steps/ block	Max. 128 steps/ block	Max. 512 steps/ block	Max. 128 steps/ block	Max. 512 steps/ block
Step Transition Watchdog Timer	Provided (8 timers)	Not provided	Not provided	Not provided	Provided (10 timers)

7.6.4 Specifications comparison of MELSAP3 between QnACPU and QCPU

When a SFC program (MELSAP3) of the QnACPU is used as a SFC program of the QCPU, a part of specifications of the SFC program differs.
Select the QCPU which satisfies the contents and configuration of the existing SFC program (MELSAP3).

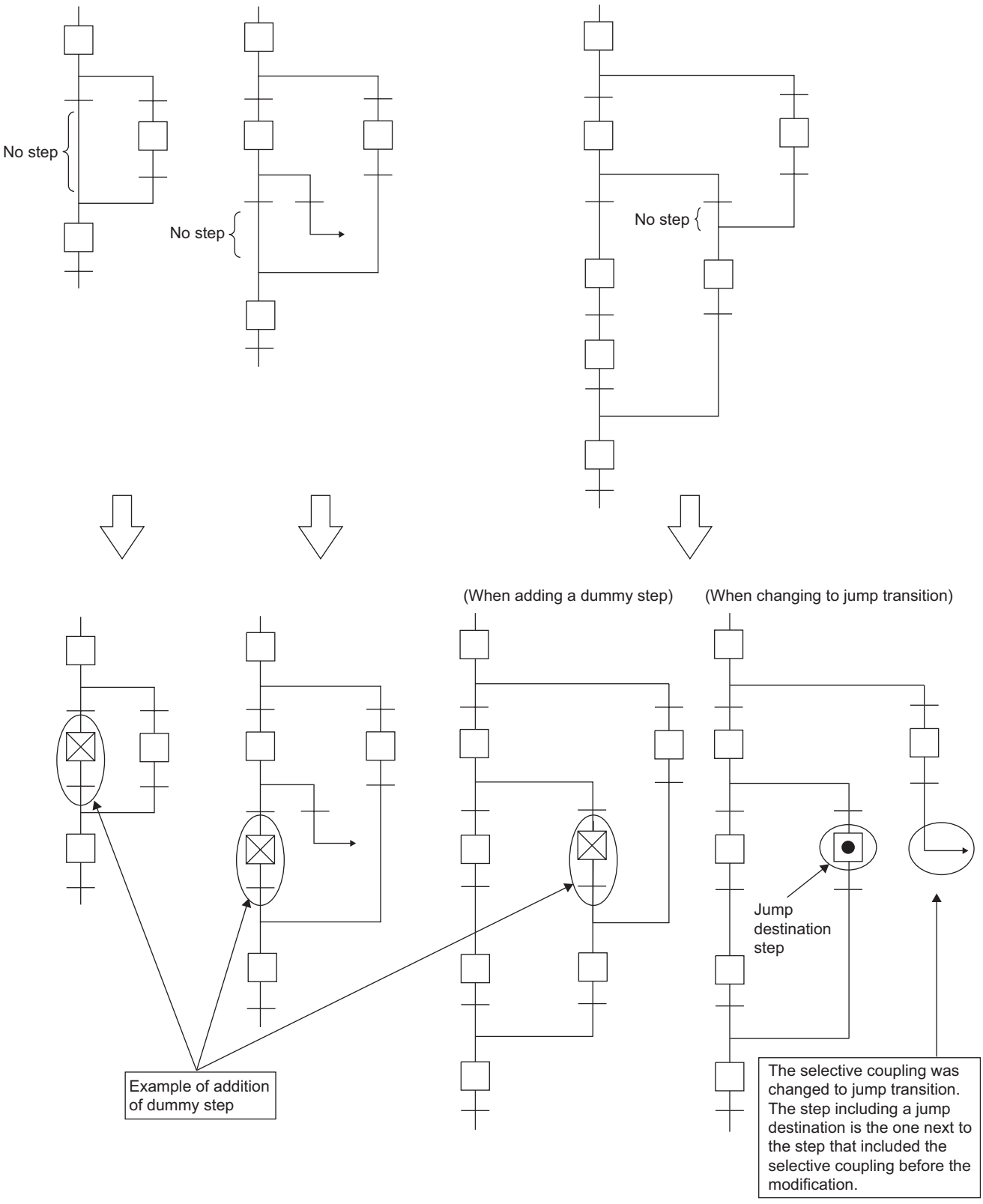
Item		MELSAP3				
		QnA	Universal model QCPU		Basic model QCPU	High Performance model QCPU
			Q00UJ, Q00U, Q01U, Q02U	Q03UD, Q04UDH, Q06UDH, Q10UD, Q13UD	Q00J, Q00, Q01	Q02(H), Q06H, Q12H
Number of blocks		Max. 320 blocks	Max. 128 blocks	Max. 320 blocks	Max. 128 blocks	Max. 320 blocks
Number of SFC steps		max. 512 steps/ block	max. 128 steps/ block	max. 512 steps/ block	max. 128 steps/ block	max. 512 steps/ block
Number of SFC steps		Max. 512 steps/ block	Max. 128 steps/ block	Max. 512 steps/ block	Max. 128 steps/ block	Max. 512 steps/ block
Step transition watchdog timer function		Provided (10 timers)	Not provided	Not provided	Not provided	Provided (10 timers)
SFC operation mode setting	Act at block multi-activated	Provided	Not provided (Fixed to "WAIT")	Not provided (Fixed to "WAIT")	Not provided (Fixed to "WAIT")	Provided
	Operation mode for transition to active step (at step double START)	Provided	Not provided (Fixed to "TRANSFER")	Not provided (Fixed to "TRANSFER")	Not provided (Fixed to "TRANSFER")	Provided
	Fixed scan execution block setting	Provided	Not provided	Not provided	Not provided	Provided
SFC control instruction	Forced transition check instruction					
	LD: TRn *1	Provided	Not provided	Not provided	Not provided	Provided
	LD: BLm\TRn *1					
	Active step change instruction					
	SCHG (D)	Provided	Not provided	Not provided	Not provided	Provided
	Transition control instruction					
	SET TRn	Provided	Not provided	Not provided	Not provided	Provided
	SET BLm\TRn					
	RST TRn					
	RST BLm\TRn					
	Block switching instruction					
	BRSET (S)	Provided	Not provided	Not provided	Not provided	Provided
SFC program for program execution management		Provided	Not provided	Not provided	Not provided	Provided
Program execution type setting		Provided	Not provided	Not provided	Not provided	Provided

*1 There are LD/AND/OR/LDI, ANI, and ORI instructions.

7.6.5 SFC diagram that cannot be read normally in another format

SFC diagram created by SW□IVD-GPPA may cause an error such as incorrect reading.
Add dummy steps before replacement with SW□GPPA. (Refer to "PRECAUTIONS FOR CREATING SFC PROGRAMS" in the GX Developer Version 8 Operating Manual (SFC).)

(Example)



7.7 Precautions for Program Replacement

7.7.1 List of applicable devices

Device name		QCPU				
Number of I/O points *9		Q00UJCPU:256 points Q00UCPU:1024 points Q01UCPU:1024 points	Q02UCPU: 2048 points Q03UDCPU Q04UDHCPU Q06UDHCPU Q10UDHCPU Q13UDHCPU: 4096 points	Q00JCPU:256 points Q00CPU:1024 points Q01CPU:1024 points	Q02CPU Q02HCPU Q06HCPU Q12HCPU: 4096 points	
Number of I/O device points*8		8192 points		2048 points	8192 points	
Internal relay		8192 points *1				
Latch relay		8192 points *1		2048 points *1	8192 points	
Step relay	Sequence program	–		–		
	SFC	8192 points		2048 points *6	8192 points	
Annunciator		2048 points *1		1024 points *1	2048 points *1	
Edge relay		2048 points*2		1024 points *2	2048 points *2	
Link relay		8192 points *1		2048 points *1	8192 points *1	
Special relays for link		2048 points		1024 points	2048 points	
Timer		2048 points *1		512 points *1	2048 points *1	
Retentive timer		0 points *1				
Counter		1024 points *1		512 points *1	1024 points *1	
Data register		12288 points *1		11136 points *1	12288 points *1	
Link register		8192 points *1		2048 points *1	8192 points *1	
Link special register		2048 points		1024 points	2048 points	
Function inputs		16 points (FX0 to FX) *7				
Function outputs		16 points (FY0 to FYF) *7				
Function registers		5 points (FD0 to FD4)				
Special relay		2048 points		1000 points	2048 points	
Special register		2048 points		1000 points	2048 points	
Link direct device		Specified from J□\G□				
Special direct devices		Specified from U□\G□				
Index register	Z	20 points (Z0 to Z19)		10 points (Z0 to Z9)	16 points (Z0 to Z15)	
	V*2	–		–	–	
File register		32768 points/block *5 *10 (R0 to R32767)		32768 points/block *5 (R0 to R32767)	32768 points/block *5 (R0 to R32767)	
Extended data register*1		0 points*11		–		
Extended link register*1		0 points*11		–		
Accumulator*3		–				
Nesting		15 points				
Pointer		512 points	4096 points	300 points	4096 points	
Interrupt pointer		128 points	256 points	128 points	256 points	
SFC block		128 points	320 points	128 points *6	320 points	
SFC transition device		Max. 128 points/block	Max. 512 points//block	Max. 128 points/ block	Max. 512 points/block	
Decimal constant		K-2147483648 to K2147483647				
Hexadecimal constant		H0 to HFFFFFFFF				
Real constant*6		E±1.17550–38 to E±3.40282+38				
Character string		"QnACPU","ABCD" *4				

	QnACPU	AnUCPU	AnACPU	AnNCPU
	Q2A: 512 points Q2A-S1: 1024 points Q3A: 2048 points Q4A: 496 points	A2U: 512 points A2U-S1: 1024 points A3U: 2048 points A4U: 4096 points	A2A: 512 points A2A-S1: 1024 points A3A: 2048 points	A1N: 256 points A2N: 512 points A2N-S1: 1024 points A3N: 2048 points
	8192 points	8192 points	Same I/O device points of applicable CPU module	
	8192 points *1	Total 8192 points		Total 2048 points
	8192 points			
	–			–
	8192 points	–		
	2048 points *1	2048 points		256 points
	2048 points *2	–		
	8192 points *1	8192 points	4096 points	1024 points
	2048 points	56 points		
	2048 points *1	Total 2048 points		Total 256 points
	0 points *1			
	1024 points *1	1024 points		256 points
	12288 points *1	8192 points	6144 points	1024 points
	8192 points *1	8192 points	4096 points	1024 points
	2048 points	56 points		
	16 points (FX0 to FXF) *7	–		
	16 points(FX0 to FXF) *7	–		
	5 points (FD0 to FD4)	–		
	2048 points	256 points		
	2048 points	256 points		
	Specified from J□\G□	–		
	Specified from U□\G□	–		
	16 points(Z0 to Z15)	7 points (Z, Z1 to Z6)		1 points (Z)
	–	7 points (V, V1 to V6)		1 points (V)
	32768 points//block *5 (R0 to R32767)	8192 points//block (R0 to R8191)		
	–	–		
	–	–		
	–	2 points		
	15 points	8 points		
	4096 points	256 points		
	48 points	32 points		
	320 points	–		
	Max.512 points//block	–		
	K-2147483648 to K2147483647			
	H0 to HFFFFFFFF			
	E±1.17550–38 to E±3.40282+38	–		
	"QnACPU","ABCD" *4	–		

*1 The number of points for use can be changed with parameters.
*2 "V" is used for edge relays for the QCPU/QnACPU.
*3 The format of instructions that use the accumulator for the AnNCPU/AnACPU/AnUCPU is changed for the Q/QnACPU.
*4 For the Q00JCPU, Q00CPU, and Q01CPU, they can be used with the $MOV instruction.
*5 The Q00JCPU does not have file registers.
*6 Applicable to the first five digits of serial number (Q00JCPU, Q00CPU and Q01CPU) of "04122" or later.
*7 Each 5 points of FX0 to FX4 and FY0 to FY4 can be used on the programs.
*8 The number of points that can be used on the programs.
*9 The number of accessible points to actual I/O modules.
*10 The total number of points of the file register, extended data register, and extended link register are set in the parameter for the Universal model QCPU.
*11 The Q00UJCPU does not have a corresponding device.

Point

The list of applicable devices does not list all devices and constants. For details, refer to the user's manual for the QCPU used.

7.7.2 I/O control method

○ : Usable, –: Unusable

I/O control method			QCPU	QnACPU	AnUCPU	AnACPU	AnNCPU
Refresh mode			○	○	○	○	○*2
	Direct I/O method	Partial refresh instructions	○	○	○	○	○
		Dedicated instructions*1	–	–	○	○	–
		Direct access input	○	○	–	–	–
		Direct access output	○	○	–	–	–
Direct mode			–	–	–	–	○*2

*1 The direct output dedicated instructions include the DOUT, DSET and SRST instruction and do not include the direct input dedicated instructions.

*2 The DIP switch on the AnNCPU enables to switch between refresh mode and direct mode.

7.7.3 Usable data format for instructions

○: Usable, △ : Conditional usable, –: Unusable

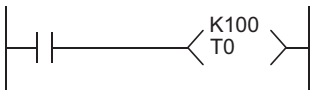
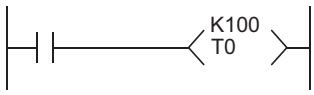
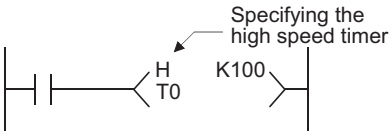
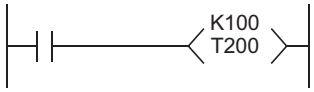
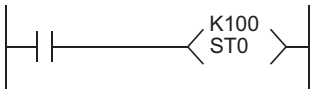
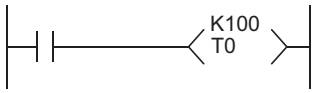
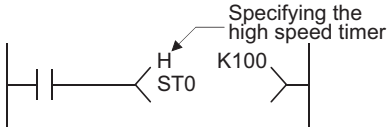
Setting data		QCPU	QnACPU	AnUCPU	AnACPU	AnNCPU
Bit data	Bit device	○		○	○	○
	Word device	○ (Bit designation required)		–	–	–
Word data	Bit device	○ (Digit designation required)		○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)
	Word device	○		○	○	○
Double-word data	Bit device	○ (Digit designation required)		○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)
	Word device	○		○	○	○
Real number data		○*1		△*3	△*3	–
Character string data		○*2		△*3	△*3	–

*1 Applicable to the first five digits of serial number (Q00JCPU, Q00CPU and Q01CPU) of "04122" or later.

*2 For the Q00J/Q00/Q01CPU, it can be used with the $MOV instruction.

*3 The AnA/AnU-dedicated instruction can be used.

7.7.4 Timer

Function		QCPU/QnACPU	AnUCPU / AnACPU / AnNCPU
Low-speed timer	Measurement unit	• 100ms (Default) Changeable in the range of 1 to 1000ms (Parameter) (QnACPU: 10 to 1000ms)	• Fixed to 100ms
	Specifying method		
High-speed timer	Measurement unit	• 10ms (Default) Changeable in the range of 0.1 to 100ms (parameter) (QnACPU: 1 to 100ms)	• Fixed to 10ms
	Specifying method		
Retentive timer	Measurement unit	• The same measurement unit as low-speed timer	• Fixed to 100ms
	Specifying method		
High-speed retentive timer	Measurement unit	• The same measurement unit as high-speed timer	• None
	Specifying method		
Setting range for set value		• 1 to 32767	• 1 to 32767
Processing the set value 0		• Instant-ON	• Infinite (No time up)
Updating present value		• When executing the OUT Tn instruction	• When executing the END processing
ON/OFF processing for contact			

(1) Precautions for using timer

Precautions for using timer are describes below. For details, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

(a) Q/QnACPU timer ladder programming method

Set the number of points for the timer and retentive timer in the Device setting of the parameter setting.

To use the low-speed timer, high-speed timer, retentive timer and high-speed retentive timer separately, add "H" or "S" to the OUT instruction in programming.

Ex.)Low-speed timer: OUT T0 Kn

High-speed timer: OUTH T0 Kn

Low-speed retentive timer: OUT ST0 Kn

High-speed retentive timer: OUTH ST0 Kn

(b) ACPU timer ladder programming method

Set the total number of points of timer, and the first device number of low-speed timer, high-speed timer and retentive timer in the Device setting of the parameter setting.

The default setting is as follows:

Number of points of timer: 256

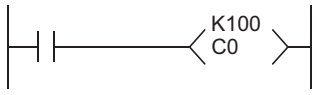
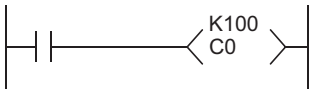
First device number of low-speed timer: 0 (T0 to T199)

First device number of high-speed timer: 200 (T200 to T255)

First device number of retentive timer: 0

When using the retentive timer, change the setting to reserve necessary number of points.

7.7.5 Counter

Function	QCPU/QnACPU	AnUCPU / AnACPU / AnNCPU
Specifying method		
Updating present value	• When executing the OUT Cn instruction	• When executing the END instruction
ON/OFF processing for contact		

7.7.6 Display instructions

Instruction	QCPU/QnACPU	AnUCPU / AnACPU / AnNCPU
PR *1	• With SM701 OFF: Outputs characters before 00_H. • With SM701 ON: Outputs 16 characters.	• With M9049 OFF: Outputs characters before 00_H. • With M9049 ON: Outputs 16 characters.
PRC *1	• With SM701 OFF: Outputs comments in 32 characters. • With SM701 ON: Outputs first 16 characters of comment.	• Outputs comment in 16 characters.

*1 The Universal model QCPU and Basic model QCPU does not support these instructions.

7.7.7 Index register

(1) Replacing index register

"Z, Z1 to Z6, V, V1 to V6" and "Z0 to Z15" are used as index register for the A series and Q series, respectively. Therefore, their specifications differ.
"V" is used as edge relay for the Q series. The device is used to memorize the PLS/PLF information to contacts from the start of the ladder block.
The following table shows replacement of index register when A series program was utilized to the Q series with "Change PLC type".

A series	Q series
Z	Z0
Z1 to Z6	Z1 to Z6
V	Z7
V1 to V6	Z8 to Z13

Point

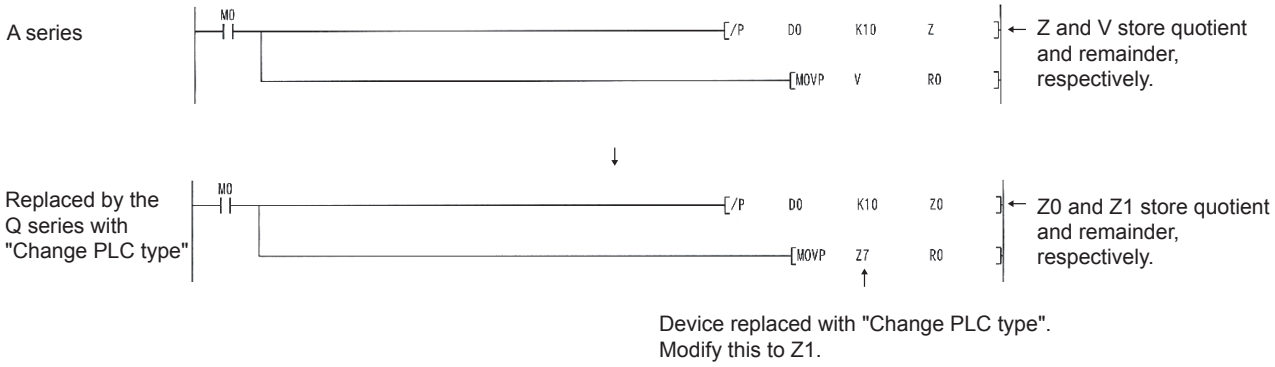
When modifying contact instructions of timer/counter with indexes, AnA/AnUCPU has no restrictions on index registers.
For QCPU, only "Z0,Z1" can be specified for index registers when modifying contact instructions of timer/counter with indexes according to its specification.
When using index registers other than "Z0,Z1" in the existing AnA/AnUCPU, it is replaced with "SM1255" as unconvertible instruction. Therefore, correcting/changing program is required.

(2) Index register 32-bit specification

When using index register as 32-bit instruction in the A series, Z and V that has the same number with Z are processed as low-order 16-bit value and high-order 16-bit value, respectively.
However, the Q series processes Zn and Zn + 1 as low-order 16 bits and high-order 16 bits, respectively.
If a program to which "Change PLC type" is performed includes index register with 32-bit specification, reviewing the index register after "Change PLC type" is necessary.
The following shows an example using an instruction whose operation result will be in 32 bits.

Instruction	A series	Q series
DMOV D0 Z1	V1, Z1 (High order) (Low order)	Z2, Z1 (High order) (Low order)
/ D0 D1 Z1	Z1(Quotient) V1(Remainder)	Z1(Quotient) Z2(Remainder)

When utilizing the A series program to the Q series with "Change PLC type", the operation result may be stored to the index register having different number as intended one.
(Example)



7.7.8 Instructions where format is changed (Excluding AnACPU/AnUCPU dedicated instructions)

Instructions using the accumulator for the AnUCPU/AnACPU/AnNCPU are changed in their format, since the QCPU/QnACPU do not have the accumulator (A0, A1).
The accumulator A0 is converted to SD718, the accumulator A1 is converted to SD719.

Function	QCPU/QnACPU		AnUCPU/AnACPU/AnNCPU	
	Format of instructions	Remarks	Format of instructions	Remarks
Right rotation of 16-bit data	ROR D n	• D: Rotation data	ROR n	• Rotation data is set in A0.
	RCR D n	• D: Rotation data • Use SM700 for carry flag	RCR n	• Rotation data is set in A0. • Use M9012 for carry flag.
Left rotation of 16-bit data	ROL D n	• D: Rotation data	ROL n	• Rotation data is set in A0.
	RCL D n	• D: Rotation data • Use SM700 for carry flag	RCL n	• Rotation data is set in A0. • Use M9012 for carry flag.
Right rotation of 32-bit data	DROR D n	• D: Rotation data	DROR n	• Rotation data is set in A0, A1.
	DRCR D n	• D: Rotation data • Use SM700 for carry flag	DRCR n	• Rotation data is set in A0, A1. • Use M9012 for carry flag.
Left rotation of 32-bit data	DROL D n	• D: Rotation data	DROL n	• Rotation data is set in A0, A1.
	DRCL D n	• D: Rotation data • Use SM700 for carry flag	DRCL n	• Rotation data is set in A0, A1. • Use M9012 for carry flag.
16-bit data search	SER S1 S2 D n	• Search result is stored in D, D +1 device	SER S1 S2 n	• Search result is stored in A0, A1.
32-bit data search	DSER S1 S2 D n	• Search result is stored in D, D +1 device	DSER S1 S2 n	• Search result is stored in A0, A1.
16-bit data checks	SUM S D	• Check result is stored in D device	SUM S	• Check result is stored in A0.
32-bit data checks	DSUM S D	• Check result is stored in D device	DSUM S	• Check result is stored in A0.
Partial refresh	RFS D n	• Add dedicated instruction	SEG D n	• Only when M9052 is on.*2
8-characters ASCII conversion	$MOV (Charactor strings) D		ASC (Charactor strings) D	*3
Carry flag set	SET SM700	• No dedicated instruction	STC	*3

Function	QCPU/QnACPU		AnUCPU/AnACPU/AnNCPU	
	Format of instructions	Remarks	Format of instructions	Remarks
Carry flag reset	RST SM700	• No dedicated instruction	CLC	*3
Jump to END instruction	GOEND	• Add dedicated instruction	CJ P255	• P255: END instruction specification*3
CHK instruction*1	CHKST / CHK	• Add CHKST instruction	CJ Pn / P254 CHK	*3

*1 Not applicable to the Q00J/Q00/Q01CPU.
*2 Deleting or adjusting is required, since it becomes the instruction of different function.
*3 Converted to "SM1255" as unconvertible instruction.

7.7.9 AnACPU/AnUCPU dedicated instruction

(1) Display method of dedicated instruction

The dedicated instructions for the AnACPU/AnUCPU using LEDA, LEDB, LEDC, and LEDR instructions are changed into instructions in the same format as basic instructions and application instructions for the QCPU/QnACPU.
Some instructions are not converted since the QCPU/QnACPU series does not have the corresponding instruction. They are converted to OUT SM1255/OUT SM999 (at Q00J/Q00/Q01CPU).
Replace or delete instructions that has been converted to the OUT SM1255/OUT SM999.

QCPU/QnACPU	AnACPU/AnUCPU
Command — Instruction name | S | D | n	Command — LEDA(B) | Instruction name LEDC/SUB | S LEDC/SUB | D LEDC/SUB | n LEDR
	S, D, n indicate the data used in instructions.

(2) Dedicated instruction with changed instruction name

For the AnACPU/AnUCPU, some instruction names are the same as the basic instructions/application instructions. Those names have been changed for the QCPU/QnACPU.

Function	QCPU/QnACPU	AnACPU/AnUCPU
Floating decimal point addition	E+	ADD
Floating decimal point subtraction	E-	SUB
Floating decimal point multiplication	E*	MUL
Floating decimal point division	E/	DIV
Data dissociation	NDIS	DIS
Data linking	NUNI	UNI
Check pattern updates	CHKCIR,CHKEND	CHK,CHKEND

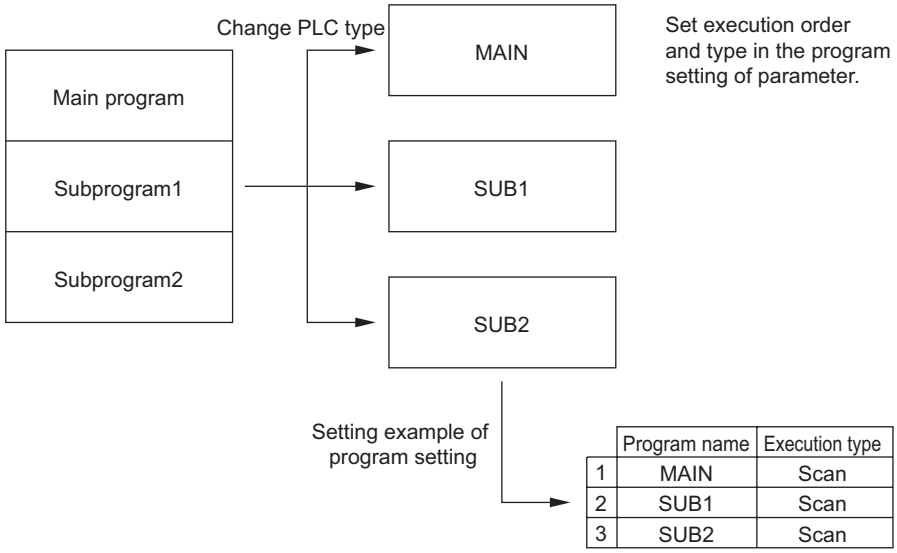
7.7.10 Setting method when multiple sequence programs are created

For the ACPU, some programs include main program and subprogram, and main programs have SFC programs. When replacing those programs with the QCPU, they are separated into different programs. For the separated programs in the QCPU, the Program setting of the parameter setting is required. This section provides precautions after replacement of program settings, etc.

(1) Program files at replacement

(a) When the main program and subprogram are operated as one program in CPU

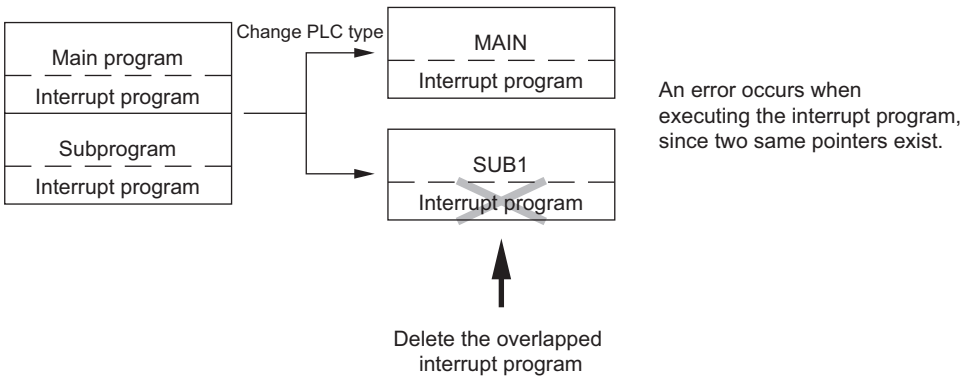
Register in the order of MAIN, SUB1, SUB2 in the Program setting of the PLC parameter of GX Developer, and set all the execution types to "Scan".
Default upon the registration is "Scan".



	Program name	Execution type
1	MAIN	Scan
2	SUB1	Scan
3	SUB2	Scan

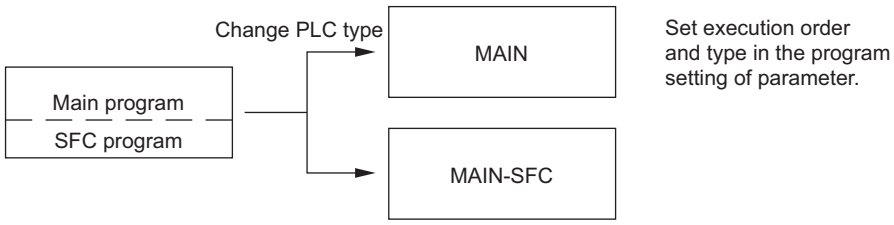
(b) When ACPU has interrupt program

For the ACPU, the main program and subprogram have the same interrupt program.
For the QCPU, delete interrupt programs except one of them, since the QCPU can assign one interrupt pointer per program.
When programs of the same interrupt pointer exist, CPU will result in error when interrupt condition is satisfied.
Register in order of MAIN, SUB1 in the PLC parameter program setting of GX Developer, and set all execution type to "Scan".



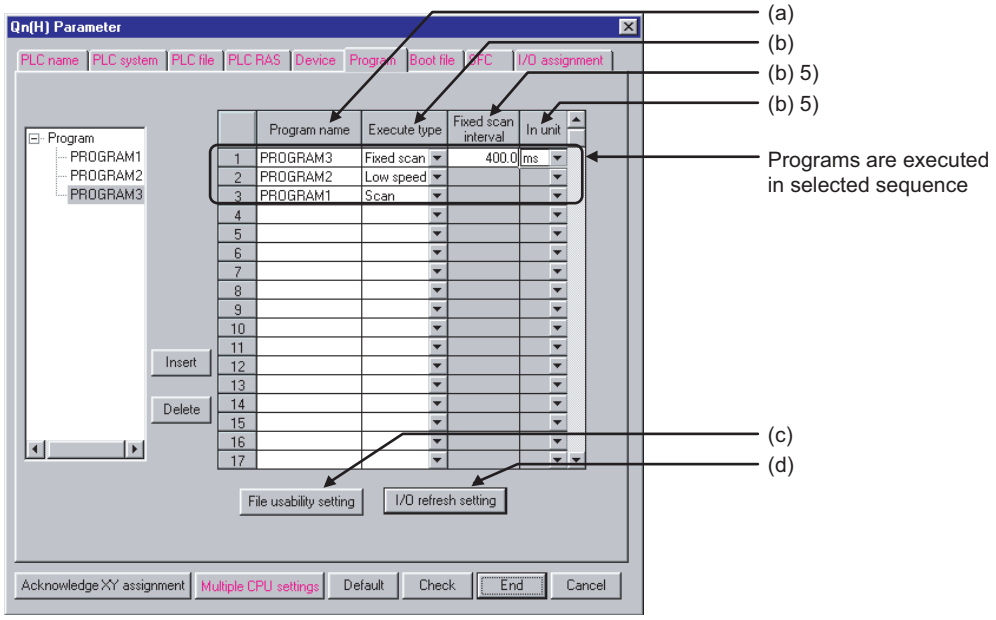
(c) When main program contains SFC program

For the ACPU, the SFC program operates as the microcomputer program of main program.
Since the QCPU deals the SFC program as one program, the SFC program is converted to "MAIN-SFC". Accordingly, two separate programs are created when the ACPU is converted; "MAIN", converted from main program, and "MAIN-SFC".
Register in the order of MAIN, MAIN-SFC in the Program setting of the parameter setting of GX Developer, and set all execution types to "Scan".
Refer to Section 7.6 for precautions of replacing from the ACPU SFC (MELSAP-II) to the QCPU (MELSAP3).



(2) Program setting of GX Developer

The following explains required program settings for executing multiple programs.
The execution type of program is set in Program setting of the PLC parameter setting of GX Developer.
A CPU module executes the programs of the specified execution type in the setting order.



(a) Program name

Set a name for a program to be executed with a CPU module.

(b) Execution type

Select the execution type of files set in the program name.

1) Initial execution type (Initial)

This type of programs is executed only one time, when switching the power supply from off to on or STOP status to RUN status.

2) Scan execution type (Scan)

This type of programs is executed every scan, after having executed the initial execution type program.

3) Low speed execution type (Low speed)

This type of programs is executed only when the constant scan or low speed type program execution time is set.

4) Stand-by type (Wait)

This type of program is executed only when demanded.

5) Fixed scan execution type (Fixed scan)

This type of program is executed per interval set in the "Fixed scan interval" and "In unit".

- Fixed scan interval

  Sets the program execution interval of fixed execution type program.

  Setting range depends on the unit set in the fixed scan interval.

- Unit

  For "ms": 0.5 to 999.5ms (0.5ms unit)

  For "s": 1 to 60s (1s unit)

  Selects the unit ("ms" or "s") for the fixed scan interval.

7.7.11 Precautions for file register replacement

This section provides precautions for replacing the ACPU or QnACPU using file registers with the QCPU.

	ACPU	QnACPU	QCPU
Storage destination	Memory cassette	Memory card (Up to 2 cards, 4 drives)	• Standard RAM • Memory card (1card)
Maximum number of points	Depends on applicable memory cassette used	1018k points × 2 (When using two 2M memory cards)	Standard RAM: Up to 512k points (Depending on CPU model) 4086k points (When using a 8M memory card)
Number of points for 1 block	8k points	32k points	32k points

(1) Changing storage destination after replacement

(a) Changing storage destination after replacement of the ACPU

The value whose capacity has been set with the parameter of ACPU is not converted, since the storage destination is different.
Set the storage destination and capacity (points) in the file setting of the PLC parameter setting.
Be sure to select "Use the following file" when setting the storage destination.
Selecting "Use the following file" makes the file equivalent to the ACPU.

(b) Changing storage destination after replacement of the QnACPU

Drive No. for storing file registers differs between the QnACPU and QCPU.
Set the parameters (Standard RAM, memory card (RAM), memory card (ROM)) according to the drive where the file register is stored.

(2) Maximum number of points

(a) Maximum number of points after replacement of the ACPU

For the ACPU with the memory cassette A4UMCA-128, the memory capacity is 1MB.
When replacing the ACPU with the QCPU, installing the SRAM card of 1MB or more secures the file register capacity of the ACPU.

(b) Maximum number of points after replacement of the QnACPU

When two memory cards have been installed and files have been switched in using, the maximum number of points may not be secured after replacing the QnACPU with the QCPU.

(3) Number of points for one block

(a) Number of points for one block after replacement of the ACPU

For the ACPU with the extension file registers, the number of points for one block is 8k points.
For the QCPU, the number of points for one block is 32k points.

(b) Number of points for one block after replacement of the QnACPU

Definition of file register capacity is the same for the QnACPU and QCPU.
When the storage destination and maximum number of points are the same, program adjustment for file registers is not required.

7.7.12 Boot run method (Writing programs to ROM)

The ROM operation of the ACPU corresponds to the boot run of the QCPU. The overview of the boot run is explained below.
For details, refer to the following.

- Qn(H)/QnPH/QnPRHCPU User's Manual(Function Explanation, Program Fundamentals)
- QnUCPU User's Manual (Function Explanation, Program Fundamentals)

(1) Boot run procedure of the Universal model QCPU

Since the program memory in the Universal model QCPU is the flash ROM, the boot run is not required. (Even if a battery error occurs, files stored in the program memory are not cleared.)
However, when the Universal model QCPU other than the Q00UJCPU, Q00UCPU, and Q01UCPU is used, the boot run with a memory card is possible.
To start the boot run with a memory card, follow the procedure below.

Step 1: Setting Boot file

Set the names of files to be booted to the program memory and the storage destination of the files in the Boot file setting of the PLC parameter.

Step 2: Inserting a memory card

Insert a memory card to the CPU module.

Step 3: Writing data to the memory card

Using GX Developer, write the parameter and set the names of files and Boot file setting to the memory card.

Step 4:Executing the program

Reset the CPU module with the RUN/STOP/RESET switch.
After the boot from the specified memory is completed, the BOOT LED turns on, and the operation starts.

(2) QCPU boot run procedure

Step 1: Setting Boot file

In the Boot file setting of the PLC parameter of GX Developer, set the file name and storage destination of the sequence program and parameter to be executed.

Step 2: Writing to standard ROM

Using GX Developer, write the sequence program and parameter to the standard ROM.

Step 3: Setting the switch of the QCPU

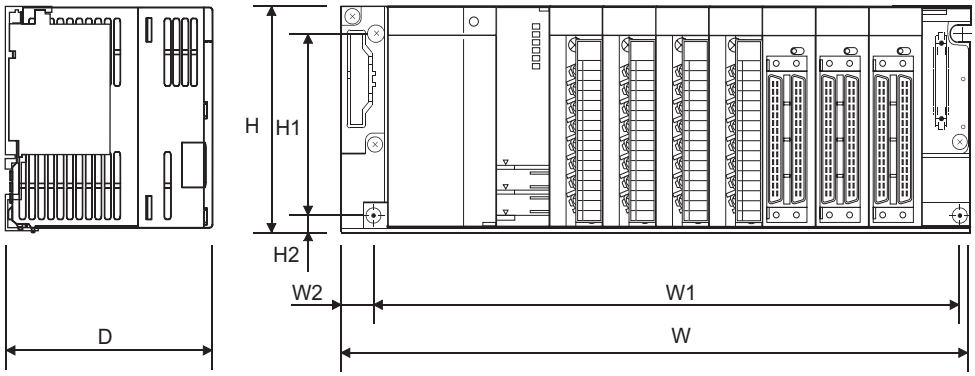
Using the DIP switch of the QCPU, set the storage destination of parameter in the standard ROM.

Step 4: Executing the program

Reset with the RESET/L.CLR switch. The operation starts with the BOOT LED lit.

8 EXTERNAL DIMENSIONS

8.1 Q Series External Dimensions and Mounting Dimensions



Unit: mm (inch)

Base unit	Dimensions			Mounting dimensions			
	H	W	D*1	H1	H2	W1	W2
Q32SB	98 (3.86)	114 (4.49)	98*2 (3.86)	80 (3.15)	7 (0.28)	101 (3.98)	8.5 (0.33)
Q33SB		142 (5.59)				129 (5.08)	
Q35SB		197.5 (7.78)				184.5 (7.26)	
Q33B		189 (7.44)				169 (6.65)	15.5 (0.61)
Q35B		245 (9.65)				224.5 (8.84)	
Q38B		328 (12.92)				308 (12.13)	
Q312B		439 (17.30)				419 (16.50)	
Q52B		106 (4.17)				83.5 (3.29)	
Q55B		189 (7.44)				167 (6.57)	
Q63B		189 (7.44)				167 (6.57)	
Q65B		245 (9.65)				222.5 (8.76)	
Q68B		328 (12.92)				306 (12.05)	
Q612B		439 (17.30)				417 (16.42)	
QA1S51B	130 (5.12)	100 (3.94)	110*3 (4.33)	110 (4.33)	10 (0.39)	80 (3.12)	10 (0.39)
QA1S65B		315 (12.41)				295 (11.61)	
QA1S68B		420 (16.55)				400 (15.75)	
QA65B	250 (9.84)	352 (13.86)	130*4 (5.12)	200 (7.87)	25 (0.98)	332 (13.07)	
QA68B		466(18.35)				446(17.56)	

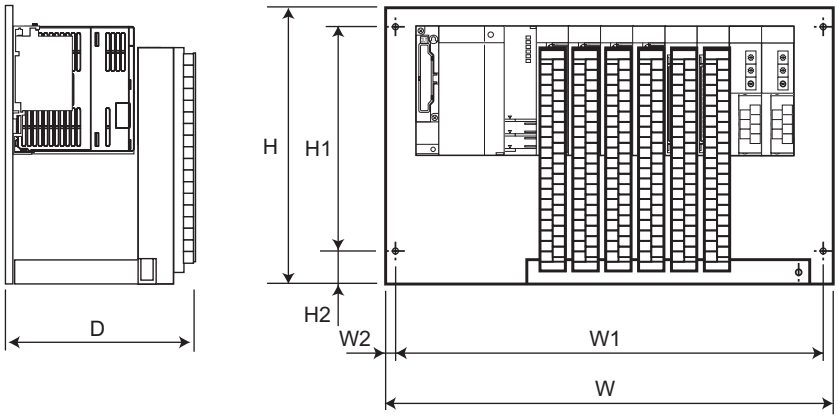
*1 D (depth) varies depending on the module to be mounted. Therefore, confirm the external dimensions of each module.

*2 For mounting Q series module of which depth is 90 mm (3.54inch).

*3 For mounting AnS series module of which depth is 93.6 mm (3.69inch).

*4 For mounting A series module of which depth is 121 mm (4.76inch).

8.2 Q Series External Dimensions and Mounting Dimensions when Mounted with the Upgrade Tool



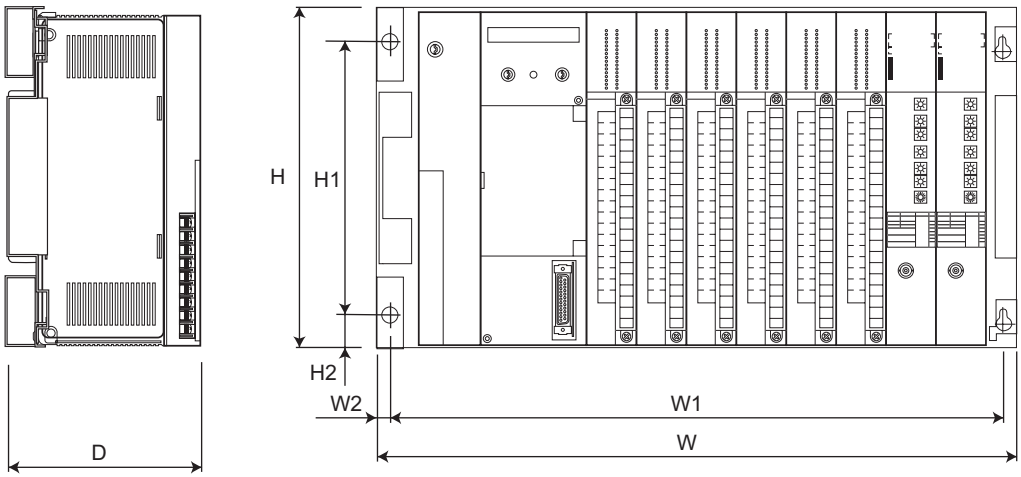
Unit: mm (inch)

Base adapter	Dimensions			Mounting dimensions				MELSEC-A series unit
	H	W	D*1	H1	H2	W1	W2	
ERNT-AQB38	240 (9.44)	480 (18.89)	166.2*2 (6.54)	200 (7.87)	25 (0.98)	460 (18.11)	10 (0.39)	A38B, A38HB
ERNT-AQB68		466 (18.35)				446 (17.56)		A68B
ERNT-AQB58		411 (16.18)				391 (15.39)		A58B
ERNT-AQB35		382 (15.04)				362 (14.25)		A35B
ERNT-AQB65		352 (13.86)				332 (13.07)		A65B
ERNT-AQB55		297 (11.69)				277 (10.90)		A55B
ERNT-AQB32		247 (9.73)				227 (8.93)		A32B
ERNT-AQB62		238 (9.37)				218 (8.58)		A62B
ERNT-AQB52		183 (7.20)				163 (6.42)		A52B

*1 D (depth) varies depending on the upgrade tool (conversion adapter) to be used.
Therefore, check the external dimensions of the upgrade tool (conversion adapter) to be used.

*2 For using the upgrade tool (conversion adapter) ERNT-AQTY22
The upgrade tool is manufactured by Mitsubishi Electric Engineering Co., Ltd.

8.3 A Series External Dimensions and Mounting Dimensions



Unit: mm (inch)

Base unit	Dimensions			Mounting dimensions			
	H	W	D*1	H1	H2	W1	W2
A32B	250 (9.84)	247 (9.72)	130*2 (5.12)	200 (7.87)	25 (0.98)	227 (8.94)	10 (0.39)
A32B-S1		268 (10.56)				248 (9.76)	
A35B		382 (15.04)				362 (14.25)	
A38B		480 (18.90)				460 (18.11)	
A38HB		480 (18.90)				460 (18.11)	
A38HBEU		480 (18.90)				460 (18.11)	
A32RB		494 (19.45)				474 (18.66)	
A33RB		570 (22.44)				550 (21.65)	
A37RHB		497 (19.57)				477 (18.78)	
A52B		183 (7.20)				163 (6.42)	
A55B		297 (11.69)				277 (10.91)	
A58B		411 (16.18)				391 (15.39)	
A62B		238 (9.37)				218 (8.58)	
A65B		352 (13.86)				332 (13.07)	
A68B		466 (18.35)				446 (17.56)	
A68RB		522 (20.55)				502 (19.76)	

*1 D (depth) varies depending on the module to be mounted. Therefore, confirm the external dimensions of each module to be mounted.

*2 For mounting A series module of which depth is 121 mm (4.76inch).

APPENDICES

Appendix 1 Basic Model QCPU

Basic model QCPU is the best module to realize the cost effectiveness for a small-scale system.
For a large-scale system, consider applying the High Performance model QCPU, which allows you fewer restrictions.

Appendix 1.1 Major restrictions

When the Basic model QCPU is compared to the High Performance model QCPU, the major restrictions are listed in the following.

(1) Program

(a) The maximum program capacity is 14K steps (when Q01CPU is selected).

(b) Program number is limited to 1 respectively for the sequence program (program name: MAIN) and for the SFC program (program name: MAIN - SFC).

(c) If SFC program has 128th block or later when it is converted, the SFC program is entirely deleted without being converted.

(2) Device

(a) File resister (R) cannot be set for Q00JCPU. Also, for Q00 and Q01CPU, up to 32K points × 2blocks can be set.

(b) The maximum timer (T)/counter (C) device points are respectively 512.
Devices over the maximum points are converted to SM999.

(c) The maximum latch relay (L) device points are 2048.
Devices over the maximum points are converted to SM999.

(3) Comments

(a) Only comments for each program (MAIN) are converted when the program is replaced.

(4) System configuration

(a) Number of I/O points, extension base unit number, and module number are shown in the following table.

	Q00JCPU	Q00CPU	Q01CPU	Q02CPU (Reference)
Number of I/O points	256	1024		4096
Number of extension base units	2 units (Max.)	4 units (Max.)		7 units (Max.)
Number of loaded modules	16 modules (Max.)	24 modules (Max.)		64 modules (Max.)
Memory card (Number of slots)	Not available.			1 slot

(b) When configurated using the Basic model QCPU, only Q series modules must be used for all the modules. Since the High Performance model QCPU does not support the QA1S51B, QA1S6B, and QA6B base unit, the A series I/O modules and intelligent device modules cannot be used.

(c) Number of network modules is shown in the following table.

	Q00JCPU	Q00CPU	Q01CPU	Q02CPU (Reference)
MELSECNET/H	1 module (only PLC to PLC network is available, remote I/O network is not available)			4 modules
Ethernet	1 module			4 modules
CC-Link	1 module			4 modules

Appendix 1.2 CPU module specifications comparison

Function	Contents	A/QnA series					
		A2CCPU	AnNCPU	AnACPU	AnUCPU	QnACPU	
Control method	Repetitive operation of stored program	○	○	○	○	○	
I/O control method	Refresh mode/Direct mode	△ *1	○ *2	△ *3	△ *3	△ *3	
Programming language	Language dedicated to sequence control (Relay symbol, Logic symbol, MELSAP language)	○	○	○	○	○	
Processing speed	Sequence instructions (μs/step)	1.25	1.0	0.15	0.15	0.075	
Watchdog timer (WDT)	Watchdog timer (WDT) (ms)	10 to 2000	10 to 2000	200	200	5 to 2000	
Memory capacity	User memory capacity (bytes)	32K (Built-in RAM)	Max. 448K (Memory cassette)	Max. 768K (Memory cassette)	Max. 1024K (Memory cassette)	Max. 2036K × 2 (SRAM card)	
Program capacity	Sequence program (steps)	Max. 8K	Max. 30K × 2	Max. 30K × 2	Max. 30K × 4	Max. 124K	
	Microcomputer program (bytes)	Max. 14K	Max. 58K	×	×	×	
Number of occupied I/O points	Number of I/O points (points) *4	512	256 to 2048	512 to 2048	512 to 4096	512 to 4096	
No. of device points	Input device (X) (points) *5	512	256 to 2048	512 to 2048	8192	8192	
	Output device (Y) (points) *5	512	256 to 2048	512 to 2048	8192	8192	
	Internal relay (M) (points)	Total 2048	Total 2048	Total 8192	Total 8192	8192	
	Latch relay (L) (points)					8192	
	Step relay (S) (points)					8192 *6	
	Annunciator (F) (points)	256	256	2048	2048	2048	
	Edge relay (V) (points)	×	×	×	×	2048	
	Link relay (B) (points)	1024	1024	4096	8192	8192	
	Timer (T) (points)	256	256	2048	2048	2048	
	Counter (C) (points)	256	256	1024	1024	1024	
	Data register (D) (points)	1024	1024	6144	8192	12287	
	Link register (W) (points)	1024	1024	4096	8192	8192	
	File register (R) (points)	4096	8192	8192	8192	32768	
	Accumulator (A) (points)	2	2	2	2	×	
	Index register (Z) (points)	1	1	7	7	16	
	Index register (V) (points)	1	1	7	7	×	
	Nesting (N) (points)	8	8	8	8	15	
	Pointer (P) (points)	256	256	256	256	4096	
	Special relay (M) (points)	256	256	256	256	2048	
	Special register (D) (points)	256	256	256	256	2048	
Comment points	Comment points (points) *7	Max. 1600	Max. 4032	Max. 4032	Max. 4032	Max. approx. 50K	
Self-diagnostics	Watchdog timer (WDT), Memory error detection, CPU error detection, Battery error detection, etc.	○	○	○	○	○	
Operation mode at error occurrence	Stop/Continue setting	○	○	○	○	○	
Output mode switching at changing from STOP to RUN	Re-output operation status before STOP/Selection of output after operation execution	○	○	○	○	○	

*1 Only refresh I/O is available.

*2 Direct I/O is also selectable with the DIP switch.

*3 Basically, only the refresh mode is applicable, but some instructions/devices can be input/output in the direct mode.

*4 This is the number of applicable points for the access to the I/O modules actually connected.

*5 This number means the number of useable points on the program.

*6 The step relays (S) of the QnA and Q series are dedicated to the SFC.

*7 This is the number of points that can be written to CPU.

○ : Usable, △ : Unusable, ×: Partially different in spec. (e.g. setting method)

	Q series Basic model			Precaution for replacement
	Q00JCPU	Q00CPU	Q01CPU	
	○	○	○	–
	△ *3	△ *3	△ *3	Use direct I/O instructions to input/output in the direct mode, as the Q series supports the refresh mode only.
	○	○	○	The MELSAP language for QnA/Q series supports is MELSAP3 and that for A series is MELSAP-II.
	0.2	0.16	0.1	–
	10 to 2000	10 to 2000	10 to 2000	–
	Max. 58K	Max. 94K	Max. 94K	A memory cassette is required for the A series as user memory, while the user memory is included in the Q series as standard equipment.
	Max. 8K	Max. 8K	Max. 14K	–
	×	×	×	The AnA, AnU, QnA and Q series do not include microcomputer program. Therefore, consider use of the sequence program, etc. as the substitution.
	256	1024	1024	–
	2048	2048	2048	–
	2048	2048	2048	–
	8192	8192	8192	–
	2048	2048	2048	–
	2048 *6	2048 *6	2048 *6	–
	1024	1024	1024	–
	1024	1024	1024	–
	2048	2048	2048	–
	512	512	512	–
	512	512	512	–
	11136	11136	11136	–
	2048	2048	2048	–
	×	32768	32768	The Q00JCPU does not have file registers.
	×	×	×	Accumulators are converted to the special registers (SD718, SD719) upon A → Q program conversion as they are not included in the QnA and Q series.
	10	10	10	–
	×	×	×	This is used as an edge relay for the QnA and Q series.
	15	15	15	–
	300	300	300	–
	1024	1024	1024	–
	1024	1024	1024	–
	Max. 1400	Max. 2300	Max. 2300	–
	○	○	○	–
	○	○	○	–
	○	○	○	–

Appendix 1.3 CPU module functional comparison

(1) Functional comparison between A2CCPU, AnNCPU and Q series CPU

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	A series		Q series basic model			Precaution for replacement
			A2C CPU	AnN CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	△	△	△	Set this function with the special register (D9020) for A series, and with parameters for Q series Basic model.
	Latch (power backup)	Holds the data of devices when turning OFF the power, resetting, and a momentary power failure longer than 20ms occurs.	○	○	○	○	○	–
	Remote RUN/ STOP	Executes the remote RUN/STOP using the external switches and peripheral devices.	○	○	○	○	○	–
	PAUSE	Stops operations while holding the output status.	○	○	○	○	○	–
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	△	△	△	For A series, an interrupt program is required for each main program and sub-program separately. For Q series Basic model, create only one interrupt program to share between the two programs.
	Microcomputer mode	Executes various controls and operations over utility programs and user created microcomputer programs stored in the microcomputer program area by calling them from the sequence program.	○	○	×	×	×	Consider use of sequence program, etc., as the substitution.
	Display of priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	×	○	○	○	Target errors vary for each module, but there is no functional differences.
	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	○	△	△	△	To execute the ROM operation with the Q series Basic model, read a sequence program stored in the standard ROM to the CPU module built-in memory using the boot run function.
	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing to programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	△	△	△	The Q series Basic model prohibits each file from being read/written by password registration, whereas the A series prohibits the parameters and programs from being read/written to the user memory by keyword registration.
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	○	○	○	In case of transition from the A series, it is necessary to re-set the parameters.
	Clock function	Q CPU includes a clock, of which data can be read and written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○*1	○	△	△	△	The Q series Basic model handles the four digits of the year (western calendar), whereas the A series handles only the last two digits.

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	A series		Q series Basic model			Precaution for replacement
			A2C CPU	AnN CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○	○	○*2	○*2	○*2	For the Q series Basic model, it is necessary to set the reserved capacity for the write during RUN in advance.
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○	○*3	×	×	×	The Q series Basic model does not include the status latch function.
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device to check the change of device status.	○	○*3	×	×	×	The Q series Basic model does not include the sampling trance function.
	Step operation (skip operation partial operation)	Stops the execution of a sequence program at the specified step.	×	○	×	×	×	The Q series Basic model does not include the step operation function. Consider the debug with GX Simulator.
	Off-line switch	Skips the devices used for OUT instruction in the operation processing of sequence program.	○	○	×	×	×	The Q series Basic model does not include the off-line switch function.
Maintenance	Online I/O module replacement	Enables I/O modules to be replace while the CPU is in RUN.	×	○	×	×	×	The Q series Basic model does not include the online I/O module replacement function.
	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	○	○	○	Error codes differ between the A series and Q series Basic model.

*1 Only A2CCPU24 (-PRF) is applicable. A2CJCPU-S3 and A2CCPU (P21/R21) are not.

*2 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

*3 The A1NCPU (P21/R21) is not applicable.

(2) Functional comparisons between AnACPU, AnUCPU and Q series CPU

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	A series		Q series Basic model			Precaution for replacement
			AnA CPU	AnU CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	△	△	△	Set this function with the special register (D9020) for the A series, and with parameters for the Q series Basic model.
	Latch (power backup)	Holds the data of devices when turning OFF the power, resetting, and a momentary power failure longer than 20ms occurs.	○	○	○	○	○	–
	Remote RUN/ STOP	Executes the remote RUN/STOP using the external switches and peripheral devices.	○	○	○	○	○	–
	PAUSE	Stops operations while holding the output status.	○	○	○	○	○	–
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	△	△	△	For A series, an interrupt program is required for each main program and sub-program separately. For Q series Basic model, create only one interrupt program to share between the two programs.
	Display of priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	○	○	○	Target errors vary for each module, but there is no functional differences.
	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	○	△	△	△	To execute the ROM operation with the Q series Basic model, read a sequence program stored in the standard ROM to the CPU module built-in memory using the boot run function.
	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing to programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	△	△	△	The Q series Basic model prohibits each file from being read/written by password registration, whereas the A series prohibits the parameters and programs from being read/written to the user memory by keyword registration.
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	○	○	○	Resetting parameters is required to replace the QnA series with the Q series Basic model.
	Clock function	Q CPU includes a clock, of which data can be read and written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○	○	△	△	△	The Q series Basic model handles the four digits of the year (western calendar), whereas the A series handles only the last two digits.

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	A series		Q series Basic model			Precaution for replacement
			AnA CPU	AnU CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○	○	○*1	○*1	○*1	For the Q series Basic model, it is necessary to set the reserved capacity for the write during RUN in advance.
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○	○	×	×	×	The Q series Basic model does not include the status latch function.
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device to check the change of device status.	○	○	×	×	×	The Q series Basic model does not include the sampling trance function.
	Step operation (skip operation partial operation)	Stops the execution of a sequence program at the specified step.	○	○	×	×	×	The Q series Basic model does not include the step operation function. Consider the debug with GX Simulator.
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in the RUN.	○	○	×	×	×	The Q series Basic model does not include the online I/O module replacement function.
	Self-diagnostics function	Executes self-diagnostics to check for errors and stops a CPU, etc.	○	○	○	○	○	Error codes differ between the A series and Q series Basic model.
	Error history	Stores errors detected by the diagnostics function into the CPU. Error details can be monitored with the peripheral devices.	○	○	○	○	○	Error codes differ between the A series and Q series Basic model. The latest 16 points are stored in the error history storage memory.

*1 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

(3) Functional comparisons between QnACPU and Q series CPU

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	QnA series	Q series Basic model			Precaution for replacement
			QnA CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Control	Constant scan	Executes the sequence program at the constant time intervals regardless of the processing time of the program.	○	○	○	○	–
	Latch (power backup)	Holds the data of devices when turning OFF the power, resetting, and a momentary power failure longer than 20ms occurs.	○	○	○	○	–
	Remote RUN/ STOP	Executes the remote RUN/STOP using the external switches and peripheral devices.	○	○	○	○	–
	PAUSE	Stops operations while holding the output status.	○	○	○	○	–
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	△	△	△	For A series, an interrupt program is required for each main program and sub-program separately. For Q series, create only one interrupt program to share between the two programs.
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	○	○	Target errors vary for each model, but there are no functional differences.
	File management	Manages all of parameters, sequence programs, device comments, file registers, etc. as files.	○	○	○	○	Only one file can be created for each file.
	Structured program	Selects a suitable execution type for program application, and divides each program by designer, process or others.	○	×	×	×	For the Q series Basic model, only one ladder program and SFC program is respectively available. Set all execution type to "Scan".
	I/O assignment	Performs the I/O assignments to any individual module regardless of its mounted position.	○	△	△	△	When using a base unit with other than 8 slots, set the number of slots with the parameter (I/O assignment setting).
	Boot run (ROM operation)	Executes the sequence program after reading it from the memory card to the CPU built-in memory when the CPU goes to RUN mode.	○	△	△	△	For the Q series Basic model, the boot run can be executed with the standard ROM built in the CPU but not with the memory card.
	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing to programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	△	△	△	The Q series prohibits each file from being read/written by password registration, whereas the QnA series prohibits the parameters and programs from being read/ written to the user memory by keyword registration.
	Device default value	Sets the default value into the device memory, file register, special function module, etc. when the CPU is changing from STOP to RUN.	○	○	○	○	–
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	○	○	Resetting parameters is required to replace the QnA series with the Q series Basic model.
	Number of general data processing	Sets the number of general data processing executed in one END operation.	○	△	△	△	For the Q series Basic model, use COM instructions or set the communication reserved time with special register (SD315) if necessary.
	Clock function	Q CPU incorporates a clock, which can be read/written. The clock data consists of year, month, day, hour, minute, second and a day of the week.	○	△	△	△	The Q series Basic model handles the four digits of the year (western calendar), whereas the A series handles only the last two digits.

○: Usable △: Unusable ×: Partially different in spec. (e.g. setting method)

Function		Contents	QnA series	Q series Basic model			Precaution for replacement
			QnA CPU	Q00J CPU	Q00 CPU	Q01 CPU	
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN mode.	○ *1	○ *1	○ *1	○ *1	For the Q series Basic model, it is necessary to set the reserved capacity for the write during RUN in advance.
	Status latch	Stores the data of all devices in the memory cassette or memory card at the occurrence of an error for monitoring by the peripheral device.	○	×	×	×	The Q series does not include the status latch function.
	Sampling trace	Stores the data of specified device at the specified intervals for monitoring by the peripheral device.	○ *2	×	×	×	The Q series Basic model does not include the sampling trace function.
	Program trace	Collects the execution status of specified programs and steps, and stores them in a file.	○ *2 *3	×	×	×	The Q series Basic model does not include the program trace function.
	Simulation function	Detaches I/O modules or special modules from the CPU module and test-operates the program when executing the step operation.	○ *3	×	×	×	The Q series Basic model does not include the simulation function. Consider the debug with GX Simulator.
	Step operation (Skip operation partial operation)	Stops the execution of a sequence program at the specified step.	○	×	×	×	The Q series Basic model does not include the step operation function. Consider the debug with GX Simulator.
	Execution time measurement (Program list monitor, scan time measurement)	Measures the operation time for each program.	○	○	○	○	–
	Module access interval time reading	Monitors the access interval time of special function modules or peripheral devices.	○	×	×	×	The Q series Basic module does not include this function.
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is RUN.	○	×	×	×	The Q series Basic module does not include the online I/O module replacement function.
	Self-diagnostics	Executes self-diagnostics to check for errors and stops a CPU, etc.	○	○	○	○	Error codes differ between the A series and Q series Basic model.
	Error history	Stores errors, detected by the diagnostics function into the CPU or memory card. The stored history can be monitored with the peripheral devices.	○	○	○	○	Error codes differ between the A series and Q series Basic model. The latest 16 points are stored in the error history storage memory.

*1 It is necessary to set the reserved capacity for the write during RUN in advance. (Default-set to 500 steps.)

*2 The SRAM card is required.

*3 GPPQ is required. This is not applicable to GX Developer.

Appendix 2 Spare Parts Storage

(1) The general specifications of programmable controllers are as follows. Please do not store spare parts under a high temperature or high humidity condition, even within the range guaranteed by the specifications.

Storage ambient temperature	-20 to 75°C
Storage ambient humidity	10 to 90%, no condensation

(2) Store in a place avoiding direct sunlight.

(3) Store under a condition with no dust or corrosive gas.

(4) The battery capacity of a A6BAT battery or a lithium-coin battery (commercially available) for memory card will be decreased by its self-discharging even when it is not used. Replace it with new one in 5 years as a guideline.

(5) For a power supply module, CPU module with built-in power supply, or analog module that uses any aluminum electrolytic capacitor, which is indicated in the table below, take the following measures since the characteristics will be deteriorated when the aluminum electrolytic capacitor is left un-energized for a long time.

Product	Model
CPU module (Power supply built-in type)	A1NCPU, A1NCPUP21, A1NCPUR21, A1NCPUP21-S3, A2CCPU, A2CCPUP21, A2CCPUR21, A2CCPUC24, A2CCPUC24-PRF, A2CJCPU-S3
Power supply module	A61P, A61PEU, A61P-UL, A62P, A62PEU, A63P, A68P, A61RP, A67RP, A2CJ66P
Analog module	A62DA, A62DA-S1

[Countermeasures for preventing aluminum electrolytic capacitor characteristics deterioration]

Apply the rated voltage to the aluminum electrolytic capacitor for several hours to activate it. Or, rotate products at the periodic inspection (in every 1 to 2 years).

[Reference]

The life of an aluminum electrolytic capacitor, even if not used, under a normal temperature decreases approximately at 1/4 speed of the case when it is energized.

Appendix 3 Related Manuals

Appendix 3.1 Materials for replacement

(1) Renewal catalogue

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA Series Transition Guide	L-08077E	–

(2) Handbook for transition

No.	Manual Name	Manual Number	Model Code
1	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals)	L-08043ENG	–
2	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Intelligent Function Modules)	L-08046ENG	–
3	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Network Modules)	L-08048ENG	–
4	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Communications)	L-08050ENG	–
5	Transition from MELSEC-A0J2H Series to Q Series Handbook	L-08060ENG	–
6	Transition from MELSECNET/MINI-S3, A2C(I/O) to CC-Link Handbook	L-08061ENG	–
7	Transition from MELSEC-I/O LINK to CC-Link/LT Handbook	L-08062ENG	–
8	Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small Type Series Handbook	L-08064ENG	–
9	Transition of CPUs in MELSEC Redundant System Handbook (Transition from Q4ARCPU to QnPRHCPU)	L-08117ENG	–

(3) Renewal examples

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA Series Transition Examples	L-08121E	–

(4) Others

No.	Manual Name (TECHNICAL BULLETIN)	Manual Number	Model Code
1	Procedures for Replacing Positioning Module AD71 with QD75	FA-A-0060	–
2	Precautions for replacing A/QnA (large type) series CPU with Universal model QCPU	FA-A-0068	–

Appendix 3.2 A/QnA series

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA Data Book	L-08029E	–
2	Type A1N/A2N (S1)/ A3NCPU User's Manual	IB-66543	13JE83
3	Type A2A (S1)/ A3ACPU User's Manual	IB-66544	13JE84
4	Type A2U (S1)/ A3U/A4UCPU User's Manual	IB-66436	13JE25
5	Q2A CPU (S1)/ Q3ACPU/Q4ACPU User's Manual	IB-66608	13J821
6	QCPU User's Manual (Hardware Design, Maintenance and Inspection)	SH-080483ENG	13JR73
7	QCPU User's Manual (Function Explanation, Program Fundamentals)	SH-080484ENG	13JR74
8	Type A2CCPU (P21/R21) , A2CCPU-DC24V, A2CCPUC24 (-PRF) , A2CJCPU User's Manual	IB-66545	13JE85
9	Type ACPU/QCPU-A (A Mode) (Fundamentals) Programming Manual	IB-66249	13J740
10	Type ACPU/QCPU-A (A Mode) (Common Instructions) Programming Manual	IB-66250	13J741
11	Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions)	IB-66251	13J742
12	Type AnACPU/AnUCPU/QCPU-A (A mode) Programming Manual (PID Control Instructions)	IB-66258	13J744
13	Type MELSAP-II(SFC) Programming Manual	IB-66361	13JF40
14	QnACPU Programming Manual (Fundamentals)	IB-66614	13JF46
15	QnACPU Programming Manual (Special Function Module)	SH-4013	13JF56
16	QCPU(Q Mode)/QnACPU Programming Manual (Common Instructions)	SH-080039	13JF58
17	QCPU(Q Mode)/QnACPU Programming Manual (PID Control Instructions)	SH-080040	13JF59
18	QCPU(Q Mode)/QnACPU Programming Manual (SFC)	SH-080041	13JF60
19	QA65B/QA68B Extension Base Unit User's Manual	IB-0800158	13JR26
20	A-A1S Module Conversion Adapter User's Manual	IB-0800352	13JQ00
21	QA6ADP QA Conversion Adapter Module User's Manual	IB-0800402	13JY50
22	I/O module type Building block User's Manual	IB-66140	13J643
23	A/D converter module type A68AD User's Manual	IB-66054	13J607
24	A/D converter module type A68AD-S2 User's Manual	IB-66213	13J647
25	Analog-Digital Converter Module type A68ADN User's Manual	IB-66307	13J668
26	Analog-Digital Converter Module type A616AD User's Manual	IB-66171	13J645
27	D/A converter module type A62DA User's Manual	IB-66053	13J608
28	D/A converter module type A62DA-S1 User's Manual	IB-66177	13J648
29	Digital-Analog Converter Module type A68DAV/DAI(S1) User's Manual	IB-66285	13J667
30	Digital-Analog Converter Module type A616DAV User's Manual	IB-66172	13J650
31	Digital-Analog Converter Module type A616DAI User's Manual	IB-66173	13J651
32	Pt100 input module type A68RD3/4 User's Manual	IB-66308	13J670
33	Type A68RD3N/4N, A1S62RD3N/4N Pt100 Input Module User's Manual	SH-080193	13JR46
34	Temperature-Digital Converter Module type A616TD User's Manual	IB-66174	13J654
35	High speed counter module type AD61-S1 User's Manual	IB-66052	13J610
36	Positioning module type AD70 User's Manual	IB-66309	13J663
37	Positioning Module Type AD72 User's Manual	IB-66095	13J622
38	A1SD75P1-S3/P2-S3/P3-S3,AD75P1-S3/P2-S3/P3-S3 Positioning Module User's Manual	IB-66716	13J871
39	Positioning module type A1SD75M/M2/M3, AD75M1/M2/M3 User's Manual	IB-66715	13J870
40	Type MELSECNET, MELSECNET/B Data Link System Reference Manual	IB-66350	13JF70
41	Control & Communication Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual	IB-66721	13J872
42	For A Ethernet Interface Module User's Manual	SH-080192	13JR45
43	For QnA Ethernet Interface Module User's Manual	SH-080146	13JR33
44	Computer Link Module (Com. link func./Print. func.) User's Manual	SH-3511	13JF77

No.	Manual Name	Manual Number	Model Code
45	Serial Communications Module User's Manual (Modem Function Additional Version)	SH-66612	13J825
46	Intelligent Communication Module type AD51-S3 User's Manual	IB-66189	13J655
47	Intelligent communication module type AD51H-S3 User's Manual	IB-66401	13JE16
48	MELSECNET/MINI-S3 Master Module Type AJ71PT32-S3, AJ71T32-S3, A1SJ71PT32-S3, A1SJ71T32-S3 User's Manual	SH-66565	13JE64
49	MELSEC-I/O Link Remote I/O System Master Module type AJ51T64/ A1SJ51T64 User's Manual	SH-66574	13J748
50	MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual	SH-080670ENG	13JR98
51	Type MELSECNET/10 Network system (PLC to PLC network) Reference Manual	IB-66440	13JE33
52	For QnA/Q4AR MELSECNET/10 Network System Reference Manual	IB-66690	13JF78
53	Control & Communication Link System Master/Local Module type AJ61QBT11/A1SJ61QBT11 User's Manual	IB-66722	13J873
54	Positioning Module Type AD71(S1/S2/S7)/A1SD71-S2(S7) User's Manual	IB-66563	13JE98
55	PC fault detection module type AS91, A1SS91, A0J2-S91 User's Manual	IB-66626	13J828

Appendix 3.3 Q series

No.	Manual Name	Manual Number	Model Code
1	iQ Platform Programmable Controllers MELSEC-Q Series [QnU] Catalog	L-08101E	–
2	QCPU User's Manual(Hardware Design, Maintenance and Inspection)	SH-080483ENG	13JP73
3	Qn(H)/QnPH/QnPRHCPU User's Manual(Function Explanation, Program Fundamentals)	SH-080808ENG	13JZ28
4	QnUCPU User's Manual (Function Explanation, Program Fundamentals)	SH-080807ENG	13JZ27
5	MELSEC-Q/L Programming Manual (Common Instruction)	SH-080809ENG	13JW10
6	MELSEC-Q/L/QnA Programming Manual (PID Control Instructions)	SH-080040	13JF59
7	MELSEC-Q/L/QnA Programming Manual (SFC)	SH-080041	13JF60
8	QA65B Extension Base Unit User's Manual	IB-0800158	13JR26
9	I/O Module Type Building Block User's Manual	SH-080042	13JL99
10	Spring Clamp Terminal Block Model Q6TE-18S User's Manual	IB-0800204	13JT72
11	Insulation Displacement Connector for MELSEC-Q Series 32-Point I/O Module User's Manual	IB-0800228	13JT92
12	Analog-Digital Converter Module User's Manual Q64AD/Q68ADV/Q68ADI/GX Configurator-AD (SW2D5C-QADU-E)	SH-080055	13JR03
13	Channel Isolated High Resolution Analog-Digital Converter Module Channel Isolated High Resolution Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual Q64AD-GH, Q62AD-DGH, GX Configurator-AD (SW0D5C-QADU-E)	SH-080277	13JR51
14	Channel Isolated Analog-Digital Converter Module/Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual Q68AD-G, Q66AD-DG, GX Configurator-AD (SW2D5C-QADU-E)	SH-080647ENG	13JR96
15	Digital-Analog Converter Module User's Manual Q62DAN, Q64DAN, Q68DAVN, Q68DAIN, Q62DA, Q64DA, Q68DAV, Q68DAI, GX Configurator-DA (SW2D5C-QDAU)	SH-080054	13JR02
16	Channel Isolated Digital-Analog Converter Module User's Manual Q62DA-FG, GX Configurator-DA (SW2D5C-QDAU-E)	SH-080281E	13JR52
17	Channel Isolated Digital-Analog Converter Module User's Manual Q66DA-G/GX Configurator-DA (SW2D5C-QDAU-E)	SH-080648ENG	13JR97
18	Analog Input/Output Module User's Manual Q64AD2DA, GX Configurator-AD (SW2D5C-QADU-J), GX Configurator-DA (SW2D5C-QDAU-J)	SH-080793ENG	13JZ25
19	RTD Input Module Channel Isolated RTD Input Module User's Manual Q64RD, Q64RD-G, GX Configurator-TI (SW1D5C-QTIU)	SH-080142	13JR31
20	Channel Isolated RTD Input Module User's Manual Q68RD3-G, GX Configurator-TI (SW1D5C-QTIU)	SH-080722ENG	13JZ06
21	Thermocouple Input Module Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual Q64TD, Q64TDV-GH, GX Configurator-TI (SW1D5C-QTIU)	SH-080141	13JR30
22	Channel Isolated Thermocouple Input Module User's Manual Q68TD-G-H01, Q68TD-G-H02, GX Configurator-TI (SW1D5C-QTIU)	SH-080795ENG	13JZ26
23	Temperature Control Module User's Manual Q64TCTT, Q64TCTTBW, Q64TCRT, Q64TCRTBW, GX Configurator-TC (SW0D5C-QTCU)	SH-080121	13JR21
24	High-Speed Counter Module User's Manual QD62, QD62E, QD62D, GX Configurator-CT (SW0D5C-QCTU)	SH-080036	13JL95
25	High Speed Counter Module User's Manual (Hardware) QD62-H01, QD62-H02	IB-0800421	13JY78

No.	Manual Name	Manual Number	Model Code
26	Type QD75P/QD75D Positioning Module User's Manual QD75P1, QD75P2, QD75P4, QD75D1, QD75D2, QD75D4	SH-080058	13JR09
27	User's Manual Type QD75M Positioning Module QD75M1, QD75M2, QD75M4	IB-0300062	ICT752
28	Q Corresponding Serial Communication Module User's Manual (Basic) QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, QJ71C24, QJ71C24-R2, GX Configurator-SC (SW2D5C-QSCU-J)	SH-080006	13JL86
29	MELSEC-Q/L Serial Communication Module User's Manual (Application) QJ71C24N,QJ71C24N-R2,QJ71C24N-R4,QJ71C24,QJ71C24-R2	SH-080007	13JL87
30	MELSEC-Q/L MELSEC Communication Protocol Reference Manual QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, QJ71C24, QJ71C24-R2, QJ71E71-100, QJ71E71-B5, QJ71E71-B2	SH-080008	13JF89
31	Q Corresponding Ethernet Interface Module User's Manual (Basic) QJ71E71-100, QJ71E71-B5, QJ71E71-B2	SH-080009	13JL88
32	Q Corresponding Ethernet Interface Module User's Manual (Application) QJ71E71-100, QJ71E71-B5, QJ71E71-B2	SH-080010	13JL89
33	Q Corresponding Intelligent Communication Module User's Manual QD51,QD51-R24	SH-080089	13JR16
34	AD51H-BASIC Programming Manual (Command) QD51/QD51-R24/ A1SD51S/AD51H-S3	SH-080090	13JF63
35	Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) QD51 QD51-R24 A1SD51S AD51H-S3	SH-080124	13JF96
36	CC-Link System Master/Local Module User's Manual QJ61BT11N	SH-080394E	13JR64
37	Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71BR11, QJ71NT11B	SH-080049	13JF92
38	Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71BR11, QJ72LP25-25, QJ72LP25G, QJ72BR15	SH-080124	13JF96
39	CC-Link/LT Master Module User's Manual QJ61CL12	SH-080351E	13JR62
40	MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual A1SJ71AP23Q,A1SJ71AR23Q,A1SJ71AT23BQ	SH-080670ENG	13JR98

Appendix 3.4 Programming too

No.	Manual Name	Manual Number	Model Code
1	GX Developer Version 8 Operating Manual	SH-080373E	13JU41
2	GX Developer Version 8 Operating Manual (SFC)	SH-080374E	13JU42
3	GX Simulator Version 6 Operating Manual	SH-080169	13JU17
4	Type SW4IVD-GPPA (GPP) Operating Manual	IB-66855	13JL62

Appendix 3.5 Products manufactured by Mitsubishi Electric Engineering Co., Ltd.

No.	Catalog name	Catalog Number
1	Mitsubishi Programmable Controller Upgrade Tool	SAN C033E·04Z

Appendix 3.6 Products manufactured by Mitsubishi Electric System & Service Co., Ltd.

No.	Data/catalog	Number
1	Renewal tool for A0J2 series Transition from MELSEC-A0J2(H) series to renewal system using renewal tool	X903071003
2	Replace A0J2(H) system with Q series using existing wiring!	X900707-115
3	Renewal tool for A0J2 series Interface module User's manual	X903071001
4	Renewal tool for A0J2 series Fixed stand/Base adaptor Replacement manual	X903071002

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.
[Gratis Warranty Term]
The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.
[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
    1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
    2. Failure caused by unapproved modifications, etc., to the product by the user.
    3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
    4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
    5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
    6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
    7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
    Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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L(NA)-08043ENG-G

Mitsubishi Programmable Controller

MITSUBISHI ELECTRIC CORPORATION

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